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INDEX TO
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INDEX OF AUTHORS

A	
ADSON, A. W. Cranio-cerebral Injuries	4
ALEXANDER, J. Applicability of Collapse Therapy to Tuberculosis in Students	121
ALLEN, T. D. Essential Hypertension	183
ALLIN, R. N. Thrombosis of Axillary Vein Following Effort	47
ALLISON, R. G. X-ray Technique	478
	190
ANDERSON, J. A., and ZIEGLER, M. R. Use of Fluids in Pediatrics	155
ANDERSON, U. S. The Study of Peritoneal Exudates	430
B	
BORMAN, C. N. Intestinal Obstruction Due to Gallstones (Abstract)	384
BOYLE, S. M., and WITTICH, F. W. A Proposed Simple Method of Determining Clinical Hypersensitiveness in Allergic Patients	285
BOYNTON, R. E. The Health of College Students and National Defense	74
BRINK, N. O., and SHANDORF, J. F. Oliguria and Hematuria Following Administration of Sulfathiazol	480
BRUNKOW, B. H. Appendicitis and Its Treatment	39
BUCHSTEIN, H. F. Protruded Intervertebral Disk, Some Practical Con- siderations	278
BURCH, E. P., WALSH, F. M., STENSTROM, W. K. Beta Irradiation in Ophthalmology	69
C	
CAMP, W. E. Hypertension from the Standpoint of the Otolaryngologist	45
CAMPBELL, O. J., and HANNAH, H. B. Hyperinsulinism	139
CAREY, J. B. Chronic Gastritis, A Clinical and Gastroscopic Study	408
CHESLEY, A. J., and WILSON, V. O. Public Health Aspects of Premature Infant Care in Minnesota	147
CHRISTENSEN, J. B., and MOON, L. E. Painless Ano-Rectal Surgery	8
CLARKE, E. K. Easing Convalescence	181
COHEN, S., and POLLAK, B. S. Tuberculosis Among Student Nurses	111
COLLINS, A. N. Arm Suspension After Breast Operation	72
COWAN, D. W., and MCKINLAY, C. A. Acute Respiratory Infections, Including Lobar Pneumonia and Atypical Pneumonia in a Young Adult Group	125
D	
DALITSCH, W. W. The Use of Bacteriophage in Treatment of Furunculosis in Students	56
DAVIES, R. Complete Community Surveys for Tuberculosis	113
DERRYBERRY, M. What the Public Knows About Health	423
DUBOS, R. J. Vulnerable Structures of the Bacterial Cell	405
E	
EANES, R. H. Relation of the Medical Profession to Selective Service	287
F	
FINK, W. H. Intracapsular Cataract Extraction	134
FORD, W. H., and HERMAN, A. L. Coincident Ectopic Pregnancy and Acute Appendicitis	227
G	
GHORMLEY, R. K. Certain Phases of Nonoperative Treatment of Fractures	282
GLASPEL, C. J. Presidential Address	325
H	
HAMBLEEN, E. C. The Sex Steroid Family	393
HANNAH, H. B., and CAMPBELL, O. J. Hyperinsulinism	139
HANSEN, A. E. Evaluation of Nutritional Status of Children	172
HART, B. M. Address of the President-Elect, "The Last Stand of the Family Doctor"	271
HENSEL, C. N. The Problem of Essential Hypertension	83
HERMAN, A. L., and FORD, W. H. Coincident Ectopic Pregnancy and Acute Appendicitis	227
HODGSON, E. R. A Case of Peripheral Neuritis Following Disulfanilamide Treatment	22
HOFFBAUER, F. W., and SPINK, W. W. Brucellosis (Undulant Fever)	13
HOFFMAN, R. A., and LOGEFEL, R. C. Gold Therapy in the Treatment of Arthritis	221
HOPKINS, N. K. Congenital Absence of the Common Duct	90
HUNTER, G. W. Sterility Investigation	41
HYDE, W. Pediatrician and Orthodontist	161
J	
JENSEN, R. A. Child Psychiatry and Pediatrics	143
K	
KNAPP, M. L., and PRYOR, H. B. Effect of Gelatin Feeding on Strength and Weight According to Body Build	484
KRAEHNBUHL, J. O. Functional Lighting in College	486
KUO, T. L. The Tuberculosis Situation in Peking	106
L	
LAMB, E. D. Fractures of the Fingers	372
LEGGETT, E. A. Spontaneous Pneumothorax of Unknown Etiology	417
LEMLEY, R. E., and MERRYMAN, M. P. Selenium Poisoning in the Human	435
LOGEFEL, R. C., and HOFFMAN, R. A. Gold Therapy in the Treatment of Arthritis	221
LOWRY, E. C. Dilantin Sodium Therapy in Epileptiform Seizures of Children	178
M	
MCKELVEY, J. L. Remote Vascular Lesions of the Toxemias of Pregnancy and Their Clinical Significance	35
	139
MCKENZIE, C. H. Diethylstilbestrol	94

JUN 1942

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THE JOURNAL-LANCET

McKINLAY, C. A., and COWAN, D. W. Acute Respiratory Infections, Including Lobar Pneumonia and Atypical Pneumonia in a Young Adult Group	125	SCHMIDT, S. G., and EMMERT, F. V. Obstetrical Analgesia with Sigmodal	213
MABEE, O. J. Address of the President	269	SCHOREGGE, C. W. Simple Versus Radical Mastectomy in Carcinoma of the Breast	203
MELLER, R. L. An Evaluation of Vitamin E in the Treatment of Multiple Sclerosis and the Progressive Muscular Atrophies	471	SCHWAB, R. S., and SKOGLAND, J. E. A Method of Evaluating the Effect of Treatment in Neuro-Muscular Disorders	401
MERRYMAN, M. P., and LEMLEY, R. E. Selenium Poisoning in the Human	435	SCOVILLE, D. H. Appendicitis—A Hazard of Youth	457
MOE, R. J. Nutritional Requirements in Pregnancy	230	SHANDORF, J. F., and BRINK, N. O. Oliguria and Hematuria Following Administration of Sulfathiazol	480
The Indications for Operative Interference in Obstetrics	79	SHAPIRO, M. J. Diagnosis of Rheumatic Fever	481
MOON, L. E., and CHRISTENSEN, J. B. Painless Ano-Rectal Surgery	8	SHERWOOD, J. V. Artificial Pneumothorax in the Treatment of Tuberculosis of the Lungs	208
MOORE, J. H. The Late Effects of the Toxemias of Pregnancy	368	SHRADER, E. L. Hospitalization of University Students	411
MOSS, A. J., STREM, E. L., and STOESSER, A. V. A Clinical Evaluation of Beta Lactose as a Prelacteal Feeding	175	SIMONS, E. J. Various Tuberculous Lesions in One Family Group	108
N			
NELSON, J. A. Some Pathological Cysts with Special Reference to the Nasopharynx	439	SKOGLAND, J. E., and SCHWAB, R. S. A Method of Evaluating the Effect of Treatment in Neuro-Muscular Disorders	401
NEWHART, H. Hearing Impairment in College Students	92	SMITH, J. Thoracic Surgery in the Insular Tuberculosis Service of Puerto Rico	122
NORTHROP, C. The Role of the General Practitioner in Detecting Tuberculosis	187	SOERENSON, P. T. Carpal Bone Fractures	76
O			
OHLMACHER, J. C. The Medical Profession's Responsibility in the Control of Cancer	441	SPINK, W. W., and HOFFBAUER, F. W. Brucellosis (Undulant Fever)	13
OLSON, O. A. Clinical Notes of the Interstate Postgraduate Association	233	STAFFORD, G. T. Opportunities for Mental-Emotional Health Guidance for Atypical Cases	19
P			
PARSON, E. I., and YOUNG, T. O. Pathological Significance of Discharge from the Non-Lactating Breast	446	STANLEY, L. L. Cold Vaccine Study	48
PERLMAN, R. M. The Relation of Self-Support to Male Student Health at the University of Michigan	28	STENSTROM, W. K., BURCH, E. P., and WALSH, F. M. Beta Irradiation in Ophthalmology	69
PIPER, M. C. Some Diseases of the Lower Part of the Genital Tract	333	STEWART, C. A. Convulsions in Childhood	1
PLATOU, E. S. Recent Advances in Chemo and Serotherapy	196	STOESSER, A. V., MOSS, A. J., and STREM, E. L. A Clinical Evaluation of Beta Lactose as a Prelacteal Feeding	175
PLATOU, R. V. Erythroblastosis Foetalis	151	STRAKOSCH, E. A. The Treatment of Vitamin A Deficiency with Intramuscular Injections of Burbot Liver Oil	453
POLLAK, B. S., and COHEN, S. Tuberculosis Among Student Nurses	111	STREM, E. L., MOSS, A. J., and STOESSER, A. V. A Clinical Evaluation of Beta Lactose as a Prelacteal Feeding	175
PRYOR, H. B., and KNAPP, M. L. Effect of Gelatin Feeding on Strength and Weight According to Body Build	484	SUNDWALL, J. Space Thinking and Time Thinking	337
R			
RAYCROFT, J. E. History and Development of Student Health Programs in Colleges and Universities	375	The American Student Health Association and the Public Health Program	292
ROBBINS, C. E. Causes of Blindness in South Dakota	219	SWANSON, J. C. The Use of Metals in Fractures	228
ROBBINS, O. F. Obstetrical Analgesia	248	SWEETSER, H. Non-Penetrating Injuries of the Heart	428
ROOST, F. H. The Care of the Acute Sinus	49	T	
ROSEKRANS, M. C. Rowing Method of Artificial Respiration	421	TILLISCH, J. H. Recent Advances in Intravenous Fluid Therapy	51
S			
SCHAAF, F. H. Recent Advances in Our Knowledge of the Avitaminoses	196	TUDOR, R. B. Corn Dermatitis	450
		W	
		WALSH, F. M., BURCH, E. P., and STENSTROM, W. K. Beta Irradiation in Ophthalmology	69
		WASHBURNE, A. C. Poison Antidotal Kit	420
		WAUGH, J. M. Endometriosis	24
		WERNHAM, J. I. Presidential Address	366
		WESTABY, J. R. Report of the South Dakota Delegate to the 1941 American Medical Association Meeting	466

WETHERBY, M.
Therapeutic Procedures in Chronic Rheumatoid Disease 414

WILDER, R. L.
Progress in Whooping Cough 428

WILSON, V. O., and CHESLEY, A. J.
Public Health Aspects of Premature Infant Care in Minnesota 147

WINER, L. H.
Hemangiomas, Classification and Treatment 168

WITTICH, F. W., and BOYLE, S. M.
A Proposed Simple Method of Determining Clinical Hypersensitiveness in Allergic Patients 285

WYATT, O. S.
Congenital Diaphragmatic Hernia 164

WYNNE, H. M. N.
Fixation of the Uterus to the Abdominal Wall with Fascial Sutures 281

Y

YLVISAKER, R. S.
The Present Status of Gastroscopic Examinations 244

YOUNG, T. O., and PARSON, E. I.
Pathological Significance of Discharge from the Non-Lactating Breast 446

Z

ZIEGLER, M. R., and ANDERSON, J. A.
Use of Fluids in Pediatrics 155

EDITORIALS

Achievement 241

American College of Surgeons 101

American Medical Association Trial 101

Another Year 494

Association Meetings 194

Being of Service 59

Business Department, The 342

Chester Arthur Stewart 240

Contents and Contributors 135

Crying, Laughing, and Swearing 426

December Colds 494

Dr. Stewart and Pediatrics 241

Don Quixote? 295

Flying Doctor, The 464

From Pirquet to Mantoux 138

Hay Fever in 1941 425

JOURNAL-LANCET Lectureship, The 426

J. Weir Mitchell Scented Disease 58

Make Haste Slowly 295

Many Called, Many Chosen 341

Medicine and the Newer Physics 463

Meeting of the Inter-State Post Graduate Medical Association 464

Motor Vehicle Accidents 383

Pediatric Number, The 193

Sex Steroid Family, The 425

This Year 31

Tuberculosis Among Children 194

Tuberculosis Christmas Seal and the Tuberculin Test, The 495

Tuberculous Pericarditis 136

Veterinarians' Contribution to Tuberculosis Control, The 137

War on the Home Front 242

Wisconsin Centennial, The 382

INDEX OF ARTICLES

A

Allergic Patients, A Proposed Simple Method of Determining Clinical Hypersensitiveness in F. W. Wittich, S. M. Boyle 285

American Medical Association 1941 Meeting, Report of South Dakota Delegate to J. R. Westaby 466

American Student Health Association: Proceedings of Twenty-first Annual Meeting 61
Tenth Annual Report of the Tuberculosis Committee 115

Analgesia: Obstetrical Owen F. Robbins 248

Obstetrical, with Sigmodal Frederick V. Emmert, Siegfried G. Schmidt 213

Ano-Rectal Surgery, Painless Louis E. Moon, J. B. Christensen 8

Antidotal, Poison, Kit Annette C. Washburne 420

Appendicitis: A Hazard of Youth Dorothea H. Scoville 457

And Its Treatment B. H. Brunkow 39

Coincident Ectopic Pregnancy and Acute Arthur L. Herman, W. Harold Ford 227

Arthritis, Gold Therapy in the Treatment of Rudolph C. Logefeil, Roy A. Hoffman 221

Artificial Pneumothorax in the Treatment of Tuberculosis of the Lungs J. Vincent Sherwood 208

Artificial Respiration, Roving Method of M. C. Rosekrans 421

Avitaminoses, Recent Advances in Our Knowledge of the Frederick H. K. Schaaf 196

Axillary Vein, Thrombosis of, Following Effort Robin N. Allin 47

B

Bacterial Cell, Vulnerable Structures of the Rene J. Dubos 405

Bacteriophage in Treatment of Furunculosis in Students, The Use of Walter William Dalitsch 56

Beta Irradiation in Ophthalmology Wilhelm K. Stenstrom, Edward P. Burch, Francis M. Walsh 69

Beta Lactose as a Prelacteal Feeding, A Clinical Evaluation of Arthur J. Moss, Edward L. Strem, Albert V. Stoesser 175

Blindness in South Dakota, Causes of Clarence E. Robbins 219

Bone Fractures, Carpal P. T. Sorenson 76

Breast: Discharge from the Non-Lactating, Pathological Significance of Thomas O. Young, E. Irvine Parson 446

Operation, Arm Suspension After Arthur N. Collins 72

Simple Versus Radical Mastectomy in Carcinoma of the C. W. Schoregge 203

Brucellosis (Undulant Fever) W. W. Spink, F. W. Hoffbauer 13

Burbot Liver Oil, The Treatment of Vitamin A Deficiency with Intramuscular Injections of E. A. Strakosch 453

C

Cancer, Control of, The Medical Profession's Responsibility in the J. C. Ohlmacher 441

Carcinoma of the Breast, Simple Versus Radical Mastectomy in C. W. Schoregge 203

Carpal Bone Fractures P. T. Sorenson 76

Cataract Extraction, Intracapsular Walter H. Fink 134

Chemo and Serotherapy, Recent Advances in 196
 Erling S. Platou

Child Psychiatry and Pediatrics 143
 Reynold A. Jensen

Childhood, Convulsions in 1
 Chester A. Stewart

Children:
 Dilantin Sodium Therapy in Epileptiform Seizures of 178
 Elizabeth C. Lowry

Evaluation of Nutritional Status of 172
 Arild E. Hansen

Cold Vaccine Study 48
 Leo L. Stanley

Collapse Therapy to Tuberculosis in Students,
 Applicability of 121
 John Alexander

College, Functional Lighting in 486
 J. O. Kraehenbuehl

Colleges and Universities, History and Development
 of Student Health Programs in 375
 Joseph E. Raycroft

Community Surveys for Tuberculosis, Complete 113
 Roberts Davies

Congenital Absence of the Common Duct 90
 N. K. Hopkins

Convalescence, Easing 181
 Eric Kent Clarke

Convulsions in Childhood 1
 Chester A. Stewart

Corn Dermatitis 450
 Robert B. Tudor

Craniocerebral Injuries 4
 Alfred W. Adson

Cysts, Some Pathological, with Special Reference
 to the Nasopharynx 439
 J. A. Nelson

D

Defense, National, The Health of College Students and 74
 Ruth E. Boynton

Deficiency, Vitamin A, The Treatment of, with
 Intramuscular Injections of Burbot Liver Oil 453
 E. A. Strakosch

Dermatitis, Corn 450
 Robert B. Tudor

Diagnosis of Rheumatic Fever 481
 M. J. Shapiro

Diaphragmatic Hernia, Congenital 164
 O. S. Wyatt

Diethylstilbestrol 94
 Charles H. McKenzie

Dilantin Sodium Therapy in Epileptiform Seizures
 of Children 178
 Elizabeth C. Lowry

Discharge from the Non-Lactating Breast,
 Pathological Significance of 446
 Thomas O. Young, E. Irvine Parson

Disk, Protruded Intervertebral, Some Practical
 Considerations 278
 Harold F. Buchstein

Disulfanilamide Treatment, A Case of Peripheral
 Neuritis Following 22
 Edward R. Hodgson

Duct, Common, Congenital Absence of the 90
 N. K. Hopkins

E

Ectopic Pregnancy and Acute Appendicitis, Coincident 227
 Arthur L. Herman, W. Harold Ford

Endometriosis 24
 John M. Waugh

Epileptiform Seizures of Children, Dilantin Sodium
 Therapy in 178
 Elizabeth C. Lowry

Erythroblastosis Fœtalis 151
 Ralph V. Platou

Exudates, The Study of Peritoneal 430
 U. Schuyler Anderson

F

Family Doctor, The Last Stand of the 271
 B. M. Hart

Fingers, Fractures of the 372
 Ernest D. Lamb

Fluid Therapy, Intravenous, Recent Advances in 51
 Jan H. Tillisch

Fluids, Use of, in Pediatrics 155
 J. A. Anderson and M. R. Ziegler

Fœtalis, Erythroblastosis 151
 Ralph V. Platou

Fractures:
 Carpal Bone 76
 P. T. Sorenson

Certain Phases of Nonoperative Treatment of 282
 Ralph K. Ghormley

Of the Fingers 372
 Ernest D. Lamb

The Use of Metals in 228
 Joel C. Swanson

Furunculosis in Students, The Use of Bacteriophage
 in Treatment of 56
 Walter William Dalitsch

G

Gallstones, Intestinal Obstruction Due to (Abstract) 384
 Chauncey N. Borman

Gastroscopic Examinations, the Present Status of 244
 R. S. Yvisaker

Gastritis, Chronic, A Clinical and Gastroscopic Study 408
 James B. Carey

Gelatin Feeding, Effect of, on Strength and Weight
 According to Body Build 484
 Helen B. Pryor and Maud L. Knapp

Genital Tract, Some Diseases of the Lower Part of the 333
 Monte C. Piper

Gold Therapy in the Treatment of Arthritis 221
 Rudolph C. Logefeil, Roy A. Hoffman

Gynecological Malignant Disease, Some Problems
 in the Treatment of (Abstract) 139
 J. L. McKelvey

H

Health, What the Public Knows About 423
 Mayhew Derryberry

Hearing Impairment in College Students 92
 Horace Newhart

Heart, Non-Penetrating Injuries of the 428
 Horatio Sweetser, Jr.

Hemangiomas, Classification and Treatment 168
 L. H. Winer

Hernia, Congenital Diaphragmatic 164
 O. S. Wyatt

Hospitalization of University Students 411
 E. Lee Shrader

Hyperinsulinism 139
 Hewitt B. Hannah, Orwood J. Campbell

Hypersensitiveness in Allergic Patients, A Proposed
 Simple Method of Determining Clinical 285
 F. W. Wittich, S. M. Boyle

Hypertension:
 Essential 183
 Thomas D. Allen

From the Standpoint of the Otolaryngologist 45
 Walter E. Camp

The Problem of Essential 83
 C. N. Hensel

I

Infant, Premature, Care in Minnesota, Public Health
 Aspects of 147
 Viktor O. Wilson, A. J. Chesley

Interstate Postgraduate Association, Clinical Notes of the 233
 O. A. Olson

Intestinal Obstruction Due to Gallstones (Abstract) 384
 Chauncey N. Borman

Intracapsular Cataract Extraction 134
 Walter H. Fink

Intravenous Fluid Therapy, Recent Advances in 51
 Jan H. Tillisch

L	
Lesions in One Family Group, Various Tuberculous Edwin J. Simons	108
Lighting in College, Functional J. O. Kraehenbuehl	486
M	
Malignant Disease, Some Problems in the Treatment of Gynecological (Abstract) J. L. McKelvey	139
Mastectomy in Carcinoma of the Breast, Simple Versus Radical C. Schoregge	203
Medical Profession, Relation of the, to Selective Service Richard H. Eanes	287
Medical Profession's Responsibility in the Control of Cancer, The J. C. Ohlmacher	441
Mental-Emotional Health Guidance for Atypical Cases, Opportunities for George T. Stafford	19
Metals in Fractures, The Use of Joel C. Swanson	228
Minneapolis Academy of Medicine, (Clinical Club), Transactions of the 64, 139, 196, 244, 384,	428
Minnesota, Infant Care in, Public Health Aspects of Premature Viktor O. Wilson, A. J. Chesley	147
Minnesota State Board of Medical Examiners: List of Physicians Licensed Nov. 8, 1940	34
List of Physicians Licensed May 9, 1941	301
List of Physicians Licensed July 11, 1941	389
Montana State Medical Association: Alphabetical Roster	363
District Society Roster, 1941	361
Presidential Address J. I. Wernham	366
Sixty-Third Annual Session, Transactions of	345
Muscular Atrophies, Progressive, An Evaluation of Vita- min E in the Treatment of Multiple Sclerosis and the Robert L. Meller	471
N	
Nasopharynx, Some Pathological Cysts with Special Reference to the J. A. Nelson	439
National Defense, The Health of College Students and Ruth E. Boynton	74
Neuritis Following Disulfanilamide Treatment, A Case of Peripheral Edward R. Hodgson	22
Neuro-Muscular Disorders, A Method of Evaluating the Effect of Treatment in Robert S. Schwab, John E. Skogland	401
North Dakota State Medical Association: Alphabetical Roster	331
District Society Roster, 1941	328
Fifty-Fourth Annual Session, Transactions of	303
Presidential Address C. J. Glaspel	325
Nurses, Tuberculosis Among Student B. S. Pollak, S. Cohen	111
Non-Lactating Breast, Pathological Significance of Discharge from the Thomas O. Young, E. Irvine Parson	446
Non-penetrating Injuries of the Heart Horatio Sweetser, Jr.	428
Nutritional Requirements in Pregnancy Russell J. Moe	230
Nutritional Status of Children, Evaluation of Arild E. Hansen	172
O	
Obstetrical: Analgesia Owen F. Robbins	248
Analgesia with Sigmodal Frederick V. Emmert, Siegfried G. Schmidt	213
Obstetrics, The Indications for Operative Interference in Russell J. Moe	79
Oliguria and Hematuria Following Administration of Sulfathiazol Norvel O. Brink and James F. Shandorf	480
Ophthalmology, Beta Irradiation in Edward P. Burch, Wilhelm K. Stenstrom, Francis M. Walsh	69
Orthodontist, and Pediatrician Walter Hyde	155
Otolaryngologist, Hypertension from the Standpoint of the Walter E. Camp	45
P	
Pathological Cysts, with Special Reference to the Nasopharynx, Some J. A. Nelson	439
Pathological Significance of Discharge from the Non-Lactating Breast Thomas O. Young, E. Irvine Parson	446
Pediatrician and Orthodontist Walter Hyde	161
Pediatrics: And Child Psychiatry Reynold A. Jensen	143
Use of Fluids in John A. Anderson, M. R. Ziegler	155
Peking, The Tuberculosis Situation in T. L. Kuo	106
Peritoneal Exudates, The Study of U. Schuyler Anderson	430
Pneumonia and Atypical Pneumonia in a Young Adult Group, Acute Respiratory Infections Including Lobar C. A. McKinlay, W. Cowan	125
Pneumothorax: Artificial, in the Treatment of Tuberculosis of the Lungs J. Vincent Sherwood	208
Spontaneous, of Unknown Etiology Elizabeth A. Leggett	417
Poison Antidotal Kit Annette C. Washburne	420
Poisoning, Selenium, in the Human Ray E. Lemley, M. P. Merryman	435
Postgraduate Association, Interstate, Clinical Notes of the O. A. Olson	233
Pregnancy: And Acute Appendicitis, Coincident Ectopic Arthur L. Herman, W. Harold Ford	227
Remote Vascular Lesions of the Toxemias of, and Their Clinical Significance J. L. McKelvey	35
Nutritional Requirements in Russell J. Moe	230
The Late Effects of the Toxemias of John H. Moore	368
Prelacteal Feeding, A Clinical Evaluation of Beta Lactose as a Arthur J. Moss, Edward L. Strem, A. V. Stoesser	175
Problems in the Treatment of Gynecological Malignant Disease, Some (Abstract) J. L. McKelvey	139
Psychiatry and Pediatrics, Child Reynold A. Jensen	143
Public Health Aspects of Premature Infant Care in Minnesota Viktor O. Wilson, A. J. Chesley	147
Public Health Program, The American Student Health Association and the John Sundwall	292
Puerto Rico, Thoracic Surgery in the Insular Tuberculosis Service of Jacob Smith	122
R	
Respiratory, Acute, Infections, Including Lobar Pneumonia and Atypical Pneumonia in a Young Adult Group C. A. McKinlay, D. W. Cowan	125

Rheumatoid Disease, Chronic, Therapeutic Procedures in Macnider Wetherby	414	Surgery, Painless Ano-Rectal Louis E. Moon, J. B. Christensen	4
Rheumatic Fever, Diagnosis of M. J. Shapiro	481	T	
Rowing Method of Artificial Respiration M. C. Rosekrans	421	Therapeutic Procedures in Chronic Rheumatoid Disease Macnider Wetherby	414
S			
Sclerosis, Multiple, and the Progressive Muscular Atro- phies, An Evaluation of Vitamin E in the Treatment of Robert L. Meller	471	Thoracic Surgery in the Insular Tuberculosis Service of Puerto Rico Jacob Smith	122
Selective Service, Relation of the Medical Profession to Richard H. Eanes	287	Thrombosis of Axillary Vein Following Effort Robin N. Allin	47
Selenium Poisoning in the Human Ray E. Lemley, M. P. Merryman	435	Toxemias of Pregnancy: Remote Vascular Lesions of the, and Their Clinical Significance John L. McKelvey	35
Self-Support, The Relation of, to Male Student Health at the University of Michigan Robert M. Perlman	28	The Late Effects of the John H. Moore	368
Serotherapy and Chemo, Recent Advances in Erling S. Platou	196	Tuberculosis:	
Sex Steroid Family, The E. C. Hamblen	393	Among Student Nurses Berthold S. Pollak, Samuel Cohen	111
Sigmodal, Obstetrical Analgesia with Frederick V. Emmert, Siegfried G. Schmidt	213	Committee, American Student Health Association, Tenth Annual Report of the Complete Community Surveys for Roberts Davies	115 113
Sinus, The Care of the Acute Frederick H. Roost	49	Early Diagnosis of Kendall Emerson	105
Sodium, Dilantin, Therapy in Epileptiform Seizures of Children. Elizabeth C. Lowry	178	In Students, Applicability of Collapse Therapy to John Alexander	121
South Dakota, Causes of Blindness in Clarence E. Robbins	219	Of the Lungs, Artificial Pneumothorax in the Treatment of J. Vincent Sherwood	208
South Dakota State Medical Association: Address of the President O. J. Mabee	269	Role of the General Practitioner in Detecting, The Cedric Northrop	187
Address of the President-Elect, "The Last Stand of the Family Doctor" B. M. Hart	271	Service, Insular, of Puerto Rico, Thoracic Surgery in the Jacob Smith	122
Alphabetical Roster	276	Situation in Peking, The T. L. Kuo	106
District Society Roster	273	Tuberculous Lesions in One Family Group, Various Edwin J. Simons	108
Report of Delegate to A. M. A. Meeting J. R. Westaby	466	Tumors and Infections, X-Ray Therapy in R. G. Allison	190
Secretary's Letters	67, 140, 467	U	
Transactions, Sixtieth Annual Session, 1941	253	Universities and Colleges, History and Development of Student Health Programs in Joseph E. Raycroft	375
Space Thinking and Time Thinking John Sundwall	337	University of Michigan, The Relation of Self-Support to Male Student Health at the Robert M. Perlman	28
Spontaneous Pneumothorax of Unknown Etiology Elizabeth A. Leggett	417	University Students, Hospitalization of E. Lee Shrader	411
Sterility Investigation G. Wilson Hunter	41	Uterus Fixation to the Abdominal Wall with Fascial Sutures H. M. N. Wynne	281
Steroid Family, The Sex E. C. Hamblen	393	V	
Student Nurses, Tuberculosis Among B. S. Pollak, S. Cohen	111	Vaccine Study, Cold Leo L. Stanley	48
Students:		Vascular Lesions, Remote, of the Toxemias of Pregnancy, and Their Clinical Significance John L. McKelvey	35
College, The Health of, and National Defense Ruth E. Boynton	74	Vitamin A Deficiency, The Treatment of, with Intramuscular Injections of Burbot Liver Oil E. A. Strakosch	453
Applicability of Collapse Therapy to Tuberculosis in John Alexander	121	Vitamin E in the Treatment of Multiple Sclerosis and the Progressive Muscular Atrophies, An Evaluation of Robert L. Meller	471
College, Hearing Impairment in Horace Newhart	92	Vulnerable Structures of the Bacterial Cell Rene J. Dubos	405
Furunculosis in, The Use of Bacteriophage in Treatment of Walter William Dalitsch	56	W	
University, Hospitalization of E. Lee Shrader	411	Whooping Cough, Progress in Robert L. Wilder	428
Student Health:		X	
Association, The American, and the Public Health Program John Sundwall	292	X-ray Technique R. G. Allison	478
At the University of Michigan, The Relation of Self-Support to Male Robert M. Perlman	28	X-ray Therapy in Infections and Tumors R. G. Allison	190
Programs in Colleges and Universities, History and Development of Joseph E. Raycroft	375		
Sulfathiazol, Oliguria and Hematuria Following Administration of Norvel O. Brink and James F. Shandorf	480		

News Items

(Continued from page 498)

Dr. William H. Long of Fargo, North Dakota, was elected president of the Alumni Association of the Mayo Foundation at a business meeting held coincident with the twenty-third annual reunion in Rochester. Dr. Long succeeds Dr. Porter P. Vinson of Richmond, Virginia. Other officers are Dr. J. M. Blackford of Seattle, Washington, first vice president; Dr. T. J. Kinsella of Minneapolis, second vice president; Dr. E. L. Meland of Minneapolis, re-elected secretary, and Dr. D. Morrison Masson of Rochester, re-elected associate secretary and treasurer.

The General and Mercy hospitals in Devils Lake, North Dakota, were among the 18 hospitals in the state and 2,872 in the nation placed on the 1941 approved list of the American College of Surgeons during the 24th annual hospital standardization conference in Boston, Massachusetts, November 3. Four institutions in the state gained approval as cancer clinics in a list which totaled 376 hospitals throughout the United States and Canada. The cancer clinics are Fargo clinic, Quain and Ramstad clinic at Bismarck, Grand Forks clinic and Northwest clinic at Minor.

Dr. Frederick A. Collier of Ann Arbor, Michigan, Professor and Director of the Department of Surgery at the University of Michigan Hospital, will give the ninth E. Starr Judd lecture at the University of Minnesota in the Chemistry Auditorium on Wednesday, January 21, 1942, at 8:15 P. M. The subject of Dr. Collier's lecture is "A Review of Studies on Water and Electrolyte Balance in Surgical Patients." The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in surgery a few years before his death.

Dr. Charles J. Beck has become associated with Dr. A. F. Hammargren in Fessenden, North Dakota. Dr. Beck served two years as junior intern in the West Side hospital, St. Paul, and one year as senior intern and house physician in the Murray hospital clinic, at Butte, Montana.

Dr. T. F. McCarthy of Lincoln, Nebraska, has endowed Creighton university at Omaha with \$25,000 to provide scholarships for members and associate members of the International College of Surgeons.

Dr. Ellery James who has been associated with Dr. H. J. Lloyd in Mankato for the past year, is now at the University of Minnesota where he has a research and teaching fellowship.

New Medical Officer Examination Announced by Civil Service Commission

The Government is faced with a critical need for physicians to serve as Associate Medical Officers in the Federal civil service in such agencies as the Veterans

Administration, the U. S. Public Health Service, the Indian Service, and others. In August of 1940, the Civil Service Commission announced an examination (Announcement No. 101) to fill Medical Officer positions of various grades in the Government service. This examination has been closed and reannounced (Announcement No. 130) with certain modifications. Applications will be accepted until further public notice.

The examination covers three grades: Associate Medical Officer, \$3,200 a year; Medical Officer, \$3,800 a year and Senior Medical Officer, \$4,600 a year. Applicants for the Medical Officer grade must have graduated from a medical school (Class A) since May 1, 1920, and for the Associate grade, since May 1, 1930. No specified time limit is set for graduation for the Senior grade.

No written test is required. Applicants are rated upon their education and experience. Senior Medical Officers must have had professional experience in one of the following: Aviation medicine, cardiology, and public health (general). Qualifying optional branches for the Medical Officers and Associate Medical Officers include: Aviation medicine; cardiology; dermatology; eye, ear, nose, and throat (singly or combined); general practice; industrial medicine; internal medicine and diagnosis; medical pharmacology; neuropsychiatry; pathology, bacteriology, and roentgenology (singly or combined); public health; surgery; tuberculosis; urology; and cancer. The maximum age limit for all grades has been raised to FIFTY-THREE.

WOMAN'S AUXILIARY TO THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

The South Dakota state auxiliary to the American Medical association held a board meeting November 25 which was planned to coincide with the visit of the national president, Mrs. R. E. Mosiman, of Seattle, Washington. Mrs. Mosiman formerly was president of the Washington state auxiliary and is the first national president from the Northwest.

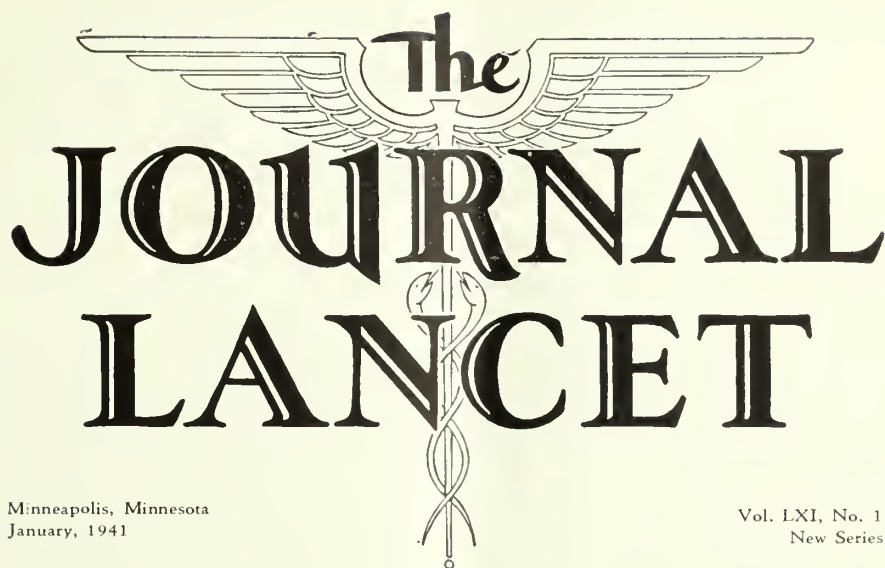
A luncheon was arranged at 1:30 o'clock by the Seventh District Medical Auxiliary in the Assembly room, and was attended by 35 members from over the state. The tables were decorated with baby chrysanthemums in bronze, yellow and white, and harmonizing corsages were presented to the guest of honor, Mrs. Mosiman, Mrs. F. C. Nilsson, state president, and Mrs. Zelda Krueger, Red Cross executive secretary.

Mrs. Mosiman gave a message on the different phases of auxiliary work, emphasizing cooperation with Red Cross work and education of the public in nutrition, for this year's program.

Mrs. Krueger spoke of the opportunities for the doctor's wife as a leader in Red Cross work.

Those who remained to finish official business accompanied Mrs. Nilsson to her home where tea was served.

Mrs. O. C. Erickson and Mrs. Anton Hyden assisted in the luncheon and program arrangements.



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Convulsions in Childhood*

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Minneapolis, Minnesota

THE factors which underlie the etiology of convulsions in children vary widely in their relative importance at different ages. Congenital brain defects and birth injuries explain the majority of the convulsive attacks seen in the first month of life, whereas acute infections are responsible for about half of the seizures seen during the following three months. Between the ages of six and twenty-four months, infantile tetany assumes the leading role as a causative factor in convulsive attacks. After the second year of life, idiopathic epilepsy occurs with increasing frequency and constitutes the most common type of convulsive disorder observed between the ages of six and sixteen years.

In approximately 85 per cent of the infants who have convulsions during the first month of life, demonstrable organic defects of the brain are present. In older age groups, functional etiologic factors increase progressively in importance, and probably account for 75 per cent of the seizures which occur in school children.

When gross organic brain defects are present, their location and extent often can be demonstrated roentgenographically provided the cerebrospinal fluid is replaced by air or other suitable gas introduced by either the spinal route or directly into the lateral ventricles. The visible evidence of anatomic defects obtained by this procedure often provides information upon which decisions relative to indicated therapeutic procedures and prognosis can be based.

In many patients encephalography and ventriculography fail to reveal pathologic changes. Under these cir-

*Read before the meeting of the North Dakota State Medical Association, Minot, May 6-8, 1940.

†Department of Pediatrics, University of Minnesota.

cumstances it is customary to attribute the convulsive seizures to functional rather than to anatomical defects.

A splendid illustration of etiologic relationship of abnormal physiologic factors to convulsive attacks is provided by a common condition seen in infants and children, namely infantile tetany.

The most dependable and constant evidence of infantile tetany is a subnormal blood calcium level. No exact parallelism exists, however, between the severity of the disease and the calcium level in the blood, owing, presumably, to variations in the degree of calcium ionization. Phosphorus also plays a role in the disease. If the blood phosphorus is low, the serum calcium can fall to lower levels without precipitating convulsions than is possible in the presence of normal or high blood phosphorus values. Furthermore, a state of latent tetany may frequently be transformed into manifest tetany either by a reduction in the H ion concentration of the blood or by an increase in the level of the inorganic phosphorus. Presumably these changes are accompanied by a reduction in the free or ionized calcium which results in an increase in the manifestations of tetany.

Although several factors are concerned in the etiology of infantile tetany, nevertheless calcium obviously occupies a position of prominence. The rapidity with which the disease responds to calcium therapy lends additional weight to the importance of the relationship of this element to tetany.

The immediate treatment of the convulsive seizures of tetany includes the administration of chloral hydrate, general anesthetics or morphine, as well as hydro-therapy

to relieve hyperpyrexia if present. In addition large amounts of calcium chloride should be administered by mouth over a period of several weeks. Calcium chloride is preferred for it is more readily absorbed and is more effective than other salts of this element. Furthermore relatively more chloride than calcium ions are absorbed, so the effect of the salt on the acid-base equilibrium is that of an acid substance. This effect presumably increases the ionization of the depleted blood calcium and thus indirectly aids in controlling the convulsive state before the total blood calcium level has been materially altered.

The administration of vitamin D preferably should be deferred until calcium has been administered for several days. If given earlier, this vitamin may result in an increase in blood phosphorus and a lowering of the plasma calcium; two changes which tend to intensify the symptoms of tetany. After the disease is satisfactorily controlled the administration of cod-liver oil serves to maintain normal blood calcium and phosphorus levels.

Presumably dihydrotachysterol should serve as a useful remedial agent in infantile tetany owing to the fact that this special form of vitamin D tends to lower the blood phosphorus and to raise the blood calcium level. Parathyroid extract produces similar changes in these minerals, thus the value of the material in the alleviation of tetany is obvious.

Slight changes in the calcium and phosphorus levels of the blood apparently have an effect on the nervous system. Children who are irritable, nervous and restless during sleep are frequently found to have a normal blood calcium but a relatively high blood phosphorus. The relationship of this condition to latent tetany is suggested by the fact that these patients may manifest a positive Chvostek sign and by the additional fact that their symptoms usually disappear when calcium chloride is administered.

A convulsive state which resembles tetany is also seen in new-born infants. In addition to manifesting a general hyperirritability of the nervous system, the tetany of the new-born often displays edema of subcutaneous tissues and the brain. The blood calcium level may be normal or low. The condition usually responds to the administration of parathyroid extract, calcium and dihydrotachysterol.

Studies conducted by Dr. McQuarrie on a parathyroid deficient patient kept on a low mineral intake for some time revealed that convulsions were readily induced by hyperventilation, by intravenous typhoid injections, and by sustained pituitary antidiuresis. Diathermy for several hours increased the patient's irritability but failed to precipitate seizures.

When a high mineral diet was given, the prolonged administration of sodium-bicarbonate in doses of 90 grams daily failed to provide convulsions even when the patient was also given pitressin and intravenous typhoid vaccine. These procedures seemed to have little significant effect on the patient's serum calcium and phosphorus levels.

The result of this and other studies were interpreted as evidence that water retention by the central nervous system without a corresponding retention of minerals plays an accessory role in the convulsive mechanism in this type of tetany. Without significantly altering the levels of the patient's serum calcium and phosphorus, a high mineral diet sufficed to protect the nervous system from such water retention. The beneficial effect of parathyroid extract in parathyroid tetany appears to depend upon a dehydrating action as well as upon a more specific function of regulating calcium and phosphorus metabolism.

An abnormal nerve-cell physiology seems to be a constitutional defect common to true epileptics. Various observations suggest that nerve-cell membranes of these patients have a relatively high semi-permeability to electrolytes and water. It is also possible that the lipid metabolism and the oxidative activities of the nerve cells may be defective in epileptic patients.

Numerous other contributing factors such as heredity, brain injuries, and tumors, congenital defects, etc., also are involved in the etiology of epilepsy. Of the various factors which contribute to the occurrence of seizures, those of biochemic and metabolic character are of extreme importance.

Since alkalosis increases and acidosis decreases nervous irritability some relationship between the acid-base equilibrium of the body fluid and the occurrence of convulsions probably exists. The presence, however, of a characteristic disturbance of the acid-base balance in epilepsy is debatable. Nevertheless conditions which produce a change toward the acid side, such as the administration of mineral acids or acid-forming salts, carbon-dioxide retention, diarrhea, fasting, and a ketogenic diet with an acid ash all favor a cessation of epileptic attacks, whereas factors which cause alkalosis, such as the administration of alkaline salts, protracted vomiting and hyperventilation of the lungs tend to induce seizures. The convulsion itself ceases with the development of the endogenous acidoses produced by the increased information of lactic acid and the retention of CO_2 .

Shifts in the electrolyte equilibria of the fluids on the two sides of the nerve-cell membrane probably take place in connection with the onset of seizures, but these changes can hardly be demonstrated during the brief period they occur.

A relationship between the water balance of the body and the occurrence of epileptic attacks seem to be quite well established. The retention of water amounting to 2 to 5 per cent of the body weight, accomplished by the administration of posterior pituitary extract (pitressin) during periods of high water and low mineral intake precipitates convulsion in the majority of epileptic children but not in non-epileptic controls. Under these conditions the extracellular fluids are diluted considerably. If this dilution of extracellular fluid is prevented by the administration of NaCl, convulsions fail to occur.

The observation, that a dilution of the body fluids may precipitate convulsions in epileptic patients, has been interpreted tentatively as supporting the view that the

semi-permeability of the nerve-cell membranes of epileptics is defective, and fails to prevent dilution of cellular fluids when the extracellular fluids are diluted. The beneficial effect of dehydration may depend on its tendency to prevent a dilution of the fluid confined within cells.

Berger demonstrated that a million-fold amplification of the electric potentials of the intact brain as they are led off at various points on the head makes it possible to obtain a visual representation of the action potentials of the brain in the form of waves recorded on a moving film. Records of the electro-encephalogram of the normal brain under standard conditions display a regular rhythm of low potential (40 to 50 millivolts) with a frequency ranging from 10 to 20 per second. Epileptic seizures accompany a demonstrable disturbance in the rhythm and in increase in the amplitude of these potentials. Grand mal attacks are characterized by a rhythm showing an increased frequency varying from 20 to 30 per second and also by an acute spiking of the waves in the electro-encephalogram. In petit mal, the slow rounded or flat-topped waves (3 to 4 per second) characteristic of psychic variants alternate with the fast spike waves. Electro-encephalograms show individual differences and also vary according to the point of which the active electrode is applied to the scalp.

During the course of an epileptic seizure the tracing reveals evidence of gradually increasing electrical activity in advance of subjective or objective signs and reaches its maximum fluctuations during the height of the attack. When simultaneous tracings are made from several points on the head, the point of origin of the disturbance may be located. In some patients the disturbance in electrical activity is found to arise in a limited area, whereas in other patients its origin is diffuse.

It has already been shown that abnormal electrical discharges are induced or accentuated by procedures which are known to produce seizures and are prevented or decreased by agents which tend to inhibit attacks.

In the past the treatment of epilepsy was limited largely to the observance of general hygienic measures, and the administration of sedative drugs. A few years ago phenobarbital was added to our armamentarium and to a large extent it has replaced the use particularly of bromides. Recently a new drug, diphenyl sodium hydantoinate (dilantin) has been shown to be of therapeutic value. Its merit seems to consist largely in the fact that its anticonvulsant effect is on a par with that of other

drugs but its depressant effect is significantly less than that of bromides and phenobarbital.

At the present time regulation of the diet of epileptic children for the purpose of accomplishing metabolic or physiochemical changes which tend to correct the underlying disturbances in brain-cell physiology is the most important form of therapy available.

Restriction of the total daily water intake probably constitutes the simplest of the dietary measures known to be of value. Although each case should be individualized, nevertheless experience permits the generalization that restriction of water consumption (the water present in the food plus the additional amount drunk) to about 900 cc. daily is practical and is quite apt to be adhered to by the child. An approximate estimate of the adherence to the diet is provided by the specific gravity of the urine. Satisfactory coöperation is indicated if the specific gravity of the urine ranges between 1025 and 1030. In connection with attempts to restrict the patient's water intake, the use of relatively dry foods and a limitation of the sodium chloride intake are helpful. A regimen of this character combined with the administration of anticonvulsant drugs usually can be employed without the necessity of hospitalizing the patient. The addition of acid forming salts as a substitute for sodium chloride, and of very dilute hydrochloric acid in place of vinegar in salad dressing, in amounts sufficient to neutralize the excess of base in alkaline foods such as vegetables and fruits, increase the effectiveness of this form of dietary therapy. Seizures can be controlled in a small percentage of mild epileptics by the use of a non-ketogenic diet with a strongly acid ash, but the combination of the ketogenic factor with the acid ash factor is usually essential to success in severe cases.

Ketosis can be established rapidly by starvation, but must be sustained by means of a ketogenic diet. While the ease with which ketosis is produced is subject to individual variation, it is usually advisable to prescribe a maintenance or sub-maintenance diet having a ketogenic-antiketogenic ratio of about 3 to 1. The beneficial effect of ketogenic diet probably relates mainly to the acidosis it produces and to the water deficit it causes.

Regardless of which type of diet is used, care should be exercised to supply the patients with all essentials of nutrition, such as minerals, vitamins, proteins, etc., particularly when a protracted dietary regimen is employed.

Craniocerebral Injuries*

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CRANIOCEREBRAL injuries have become so numerous that no physician can escape their treatment. A review of the literature may convey that there is considerable confusion about the accepted methods of treatment. However, on careful analysis of the different reports one learns that all writers on cranial injuries agree that the injured patient should be promptly treated for shock and intracranial hemorrhages and that debridement should be employed for scalp, skull and cerebral injuries. Authors are divided concerning the indications for spinal drainage, which suggests that the extreme views of those that advocate never doing, or always doing a spinal puncture following a craniocerebral injury should be modified. There are times when one would like to know whether blood is present in the spinal fluid, and occasionally spinal drainage supplements dehydration in controlling cerebral edema.

The management of increased intracranial pressure resulting from a cerebral injury is not always easy to outline, since hemorrhage as well as edema may produce the increased pressure. Extradural subdural and intracerebral hemorrhages require surgical treatment. Cerebral edema can be controlled by nonoperative measures as well as by a cranial decompression. Hence, we find that two schools of thought exist. The one advocates operative measures,⁴ the other nonoperative treatment.⁵ Those who believe in the operative treatment for increased intracranial pressure argue that intracranial hemorrhages will often be overlooked unless craniotomy is performed. Those who advocate the nonoperative treatment argue that unless the hemorrhage is massive, surgical intervention may be avoided.

The nonoperative treatment consists of three procedures. The first is that of active dehydration accomplished by saline cathartics, intravenous administration of hypertonic solutions and limitation of fluids. The second consists of diagnostic spinal punctures and repeated spinal drainages. The third is frequently referred to as the "do nothing" treatment, since neither dehydration, spinal drainage nor temporal decompression is employed. Those advocating this treatment carry out the usual careful management of traumatic shock, employ surgical procedures for the control of hemorrhages, elevation of fragments and thorough debridement of compound comminuted fractures and administer barbiturates to quiet the patient, but give no fluids until the second or third day, thus allowing the patient to dehydrate himself.

There are distinct merits and limitations in all the individual procedures. Undoubtedly an occasional cerebral herniation may follow excessive spinal drainage.⁹ De-

hydration may be carried to excess, especially if the patient is in deep coma and is unable to take fluids by mouth. The "do nothing" treatment may result in death if there is a high degree of increased intracranial pressure. The temporal or suboccipital decompression may also fail to give sufficient relief to control the increased intracranial pressure. I have observed, even though my experience is not so extensive as that of Munro, Mock, Fay, Dandy, Coleman, Rand, and others³ who have emergency services in large city hospitals, that a combination of two or more of these various procedures often proves more effective in treating increased intracranial pressure than rigid adherence to one type of treatment. It is extremely important to recognize the extent of the injury in order to select the most suitable treatment.

In outlining treatment for head injuries I find it convenient to discuss three phases: emergency treatment, convalescent treatment, and treatment of posttraumatic sequelae.

EMERGENCY TREATMENT

The emergency treatment consists of transferring the injured individual to the hospital, recognizing the extent of the injury, treating traumatic and cerebral shock, controlling hemorrhages, operative procedures on compound fractures, and the management of increased intracranial pressure when present.

When called to attend a patient who has met with an accident, one should always be on the alert to evaluate the whole situation, the nature of the accident, the force of the impact and the position of the patient at the time of the accident and following the accident, because internal injuries, fractures of the spine or fracture of bones other than those of the skull may be more serious than the head injury. It is not always easy to determine the extent of the head injury at the place of the accident, but one should observe the mental status, whether or not the patient has been temporarily unconscious, is confused or is stuporous and in deep coma. It is needless to emphasize the fact that obvious hemorrhages need to be controlled and the patient should be transferred without increasing the trauma already produced by fractured bones. Occasionally, the cerebral trauma appears to be slight and the patient has regained consciousness and sees no reason for being hospitalized. If the attending physician permits the patient to return to his home rather than to a hospital, the relatives or friends should be instructed concerning the dangers of hemorrhages and the symptoms that may develop. In most instances the rational advice is to urge the patient, even though the injury may appear slight, to be hospitalized for forty-eight hours.

Concussion. Concussion is the simplest form of craniocerebral injury. It is a common term applied to head injuries and frequently employed by the laity. It should be restricted to those cases in which a blow on the head

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†Section on neurologic surgery, The Mayo Clinic, Rochester, Minnesota.

has produced some degree of unconsciousness, but in which the patient on recovery presents no residual symptoms. The exact pathologic basis of this phenomenon is unknown; concussion is believed by some to be due to a molecular disintegration resulting from anatomic changes and circulatory damage. Others hold that there is a disturbance in the ions and electrons. Changes in pressure on subcortical vessels from fluid waves as the result of the impact may also be an explanation for the temporary unconsciousness. According to Munro, a violent histologic insult to the brain must be predicated to produce such changes.

The disturbance of consciousness may vary from a short period of semi-consciousness, a dazed or confused state, to one of deep coma. Many of the patients are restless and delirious. The majority regain consciousness within hours to three or four days, while in others the loss of consciousness may continue for several weeks.

Treatment of shock. Though it may be difficult to distinguish between the symptoms that are due to general shock and those due to cerebral shock, the emergency treatments are very similar. Heat should be applied in the form of warm blankets; skeletal fractures should be temporarily supported; stimulants such as caffeine and ephedrine should be administered. In the event of severe hemorrhages, the foot of the bed may be raised and a transfusion administered. As soon as the blood pressure returns to normal and the body becomes warm, examinations should be conducted.

A general examination to determine the extent of bodily injuries other than that to the head should be conducted in conjunction with a neurologic examination. The neurologic examination may be rather unsatisfactory in a comatose or non-coöperative patient, but it is possible to determine whether or not one or both pupils are dilated or whether a squint is present. It is also possible to determine whether or not a flaccid or a rigid paralysis exists and whether the reflexes are normal, lost or exaggerated, or if localized ecchymosis or hemorrhage from the ear or from the nasal orifices is present. The appearance of cerebrospinal fluid from the ear or nasal passages or from the compound fracture is significant. Roentgenographic examinations of the head in the antero-posterior and lateral views and roentgenographic examinations of suspected fractures of other bones are of inestimable value.

When immediate surgical intervention is indicated, it may become necessary on admission to the hospital to take the patient to the operating room, where reparative procedures can be employed simultaneously with the treatment of shock and other bodily injuries. In the event that the patient is delirious a sedative is necessary, but one should never administer morphine since it is a respiratory depressant. The barbiturates, sodium iso-amylethyl barbituric acid and pentobarbital sodium, are the most effective. If it becomes necessary to anesthetize the patient during the emergency surgical procedures, a general anesthetic may be necessary, for a delirious patient rarely coöperates with the surgeon even though the latter anesthetizes the scalp with a local anesthetic. The anesthetic that has proved of greatest value is

sodium ethyl thiobarbiturate administered intravenously.

In cleansing and repairing a scalp, skull and brain wound, care should be taken to shave the hair well beyond the wound, remove all foreign material, trim the traumatized edges, remove spicules of bone, prolapsed brain, and aspirate intracerebral clots. An aqueous solution of an organic mercurial germicide is used for cleansing compound comminuted fractures of the skull with the accompanying lacerations of the scalp and brain. The dura should be closed with interrupted sutures of catgut, and the scalp with interrupted dermal sutures of either silk or silkworm gut. Occasionally it is necessary to approximate the edges of the galea with interrupted sutures of catgut. I prefer not to use silk sutures below the scalp in a traumatic wound for fear that an infection may be present, in which case the silk sutures would have a tendency to continue the infection. Small strips of rubber tubing may be used for drainage. Hemostasis can be effected by ligatures of catgut, by silver clips or by the electrocoagulation current. In the event that there is a depressed fracture or a comminuted fracture which is not compound, the fragments can be elevated and tied in place with silver wire forming a mosaic pattern at the site of injury. These fragments are held in place by threading interrupted loops of silver wire through gimlet hole openings made in the fragments and in the skull along the margin of the fracture.

On the completion of the emergency surgical treatment of the head injury and other bodily injuries, the patient is returned to his bed, where the treatment for shock is continued. The administration of antitetanic and antigas serum is indicated when abrasions, cuts or lacerated wounds have been sustained. It should not be given until the patient has recovered from general shock. Oftentimes it is wise to delay the injection of these serums until the day following the injury.

Fractures. Fractures of the skull may be divided into three groups: linear, depressed and comminuted, all of which may or may not be compound.

The linear fractures most frequently involve the base of the skull and not infrequently extend into the nasal sinuses or across the temporal bone. The hemorrhages accompanying them are not serious unless the tears in the meninges extend across meningeal arteries or the cavernous sinus. Linear fractures across the temporal bone frequently result in tearing of the middle meningeal artery with the development of an extradural hemorrhage. Linear fractures extending across the longitudinal or lateral sinuses may have an accompanying tear in the venous sinuses with the development of both an extradural and a subdural hemorrhage. The basal fractures which result in tearing of the meninges will manifest themselves by localized ecchymosis and the escape of blood-tinged cerebrospinal fluid from the nose or the ear. Accumulations of blood will produce signs of increased intracranial pressure. Injuries to the oculomotor nerves will be evidenced by oculomotor palsies; injuries of the petrous portion of the temporal bone are usually associated with facial paralysis and deafness. The symptoms resulting from extradural hemorrhages are delayed

and it is not uncommon for a patient to regain consciousness for several hours following the injury and then to lapse again into a state of coma. Extradural hemorrhages also produce a unilateral dilatation of the pupil and a contralateral spastic hemiplegia. Therefore, a patient should be kept under close observation for the first forty-eight hours whenever a fracture is situated over a meningeal artery or a large sinus. Accumulation of blood in the posterior fossa or trauma to the cerebellum produces nystagmus and cerebellar ataxia and occasional paralysis of the sixth nerve. Fractures of the floor of the posterior fossa may result in tears of the ninth, tenth, eleventh and twelfth cranial nerves.

Depressed fractures vary in extent and location. Small depressed fractures over the silent regions of the brain may be of no serious consequence and need no surgical treatment just as simple linear fractures need no special treatment. If, however, the depressed fracture tears an important vessel the blood clot will need to be evacuated and the hemorrhage controlled. If a depressed fracture occurs in the frontal bone an elevation is indicated for cosmetic reasons. The elevation of such a fracture may be postponed until the patient has recovered from the immediate effects of his head injury. Depressed fractures over the motor, speech or visual centers should be elevated as soon as the traumatic shock has been treated.

Comminuted fractures may or may not be depressed. Whenever the physical examination or the roentgenographic examination reveals spicules driven into the brain they should be withdrawn and the fragments should be elevated, replaced and held in position by silver wire ties if the wound is not compound. Most depressed fractures are comminuted; occasionally it is possible, after making a single trephine opening, to introduce an elevator under the depression and restore its former contour. In the event that fragments of bone are removed a plastic repair may be performed at some later date. Occasionally if the bony defect be small, no repair is necessary unless the fracture has occurred in the frontal bone, when, for cosmetic reasons, a repair is indicated.

Control of hemorrhages. Extradural arterial hemorrhages are controlled through a decompression type of craniotomy or through a small flap craniotomy by the application of a silver clip, by ligation of the vessel with silk or by the electrocoagulating needle. Extradural clots are evacuated and the pockets are cleansed with saline solution. If a marked cerebral depression has resulted, a small tube drain should be left in place for twenty-four hours. Tears in the large sinuses should be explored at the location of the fracture across the sinus. This is done by trephining over the location and enlarging it sufficiently to expose the tear. Rents in the sinus are repaired by the application of a pledget of muscle which is held in place by a wick of gauze for seventy-two hours. The dura, lateral to the sinus, should be incised in order to determine whether or not the tear in the sinus has resulted in an extravasation of venous blood into the subdural spaces. Such lacerations are also repaired by pledgets of muscle. The subdural hemorrhages are re-

moved by repeated aspirations and saline washings. The dura is closed with either catgut or silk, depending on whether or not the wound is compound.

Occasionally subdural hemorrhages² result from tears in small vessels extending from the dura to the arachnoid. These tears result in slow extravasations of blood with the development of symptoms of intracranial pressure or focal signs of compression. These injuries may not be accompanied by skull injury. The suspicion of a subdural hematoma justifies bur-hole openings and incisions in the dura to clarify the diagnosis. Occasionally a patient will appear to recover from the symptoms of an acute head injury, but fail to regain his normal health. Drowsiness may persist; headaches may continue; focal signs may fail to disappear weeks or even months after a head injury. When this occurs one must consider the possibility of a subdural hematoma. A diagnostic encephalogram may reveal distorted contours in the ventricular system and a failure in the equal distribution of air in the subarachnoid spaces. Since the subdural hemorrhage is free to travel between the dura and the arachnoid on both sides of the brain it is wise to trephine on both sides to avoid overlooking the subdural hematoma on the contralateral side of the injury. Subdural hematomas, unless they have been of long duration, can be aspirated and the pockets washed with saline by the employment of a small catheter which is attached to a syringe. If the hemorrhage has been extensive it may be necessary to make two or three trephine openings and leave a No. 18 catheter as a through-and-through drainage to prevent any subsequent refilling of the cavities. The brain will eventually expand by the refilling of the ventricles and the subarachnoid spaces. This may be hastened by forcing the amount of liquids taken by the patient.

Hemorrhages of the base from tears in the dura are not easy to cope with. If one is in doubt a temporal exploratory decompression is indicated. With an illuminated retractor it is possible to elevate a cerebral lobe and control the meningeal bleeding with an electrocoagulating needle. Hemorrhages from a cerebral vessel can be controlled in a similar manner or with the aid of a silver clip. Usually the hemorrhages are not severe unless a branch of the meningeal artery is torn or the cavernous sinus has been injured. The latter injury, when it occurs, results in such a rapid extravasation of blood that the patient frequently succumbs before surgical treatment can be instituted. If one is fortunate enough to localize the hemorrhage from a vessel of the cavernous sinus it is controlled with a pledget of muscle by a technic similar to that employed when injuries occur to the superior longitudinal and lateral sinuses.

As a rule, it is not wise to attempt a repair of the meninges when an escape of cerebrospinal fluid occurs from the nasal sinuses or the middle ear. One should not perform spinal punctures or spinal drainage for fear of reversing the current and drawing nasal discharges into the meningeal spaces. The judicious use of sulfanilamide serves as a prophylactic measure in minimizing the development of meningitis. The introduction of

sterile cotton pledgets into the external ear serves as another protective measure. Usually the cerebrospinal fluid ceases to drip within a week or ten days. Should a cerebrospinal fistula develop, an intracranial repair of the meninges by suture or by the application of a muscle pledget should not be undertaken within less than eight to twelve weeks following the head injury.

Tears in the meninges, especially in the region of the ethmoid and frontal sinus, result not only in cerebrospinal leaks, but occasionally in a pneumocephalos. These can be visualized by roentgenographic examination. Most of them disappear spontaneously, but occasionally an air cavity may exist for weeks. If it is of any serious size a trephine opening may be employed for the introduction of a brain cannula and the withdrawal of the air in the cavity.

Hygromas may simulate subdural hematomas since a tear in the arachnoid which usually occurs along the sylvian fissure permits cerebrospinal fluid to enter the space between the dura and the arachnoid. These are corrected by performing a small decompression, opening the dura and allowing the fluid to escape. Again a small tube drain is left in place for several days until the ventricles expand and force the brain against the dura and the cranial wall.

Cerebral trauma. Cerebral trauma varies from a localized bruise with punctate hemorrhages to extensive lacerations of the brain. The *contrecoup* injuries may be as great as those at the point of impact. The skull injury is rarely an indication of the extent of the cerebral injury. The degree of coma, the state of the pulse, respirations, blood pressure, and the evidence of neurologic signs furnish the only accurate evaluation of the cerebral injury. Even then it may be difficult to arrive at an accurate opinion, since a rapidly developing cerebral edema or intracranial hemorrhage may exaggerate the symptoms. If symptoms of a localized condition exist, an exploratory decompression may be required to eliminate the possibility of an intracranial hemorrhage. The symptoms resulting from cerebral edema are more or less diffuse; restlessness or coma may persist for hours and days without evidence of localized paralysis.

Intracranial pressure. Increased intracranial pressure usually follows a craniocerebral injury.^{8,10} It results from cerebral edema and intracranial hemorrhages. With the absence of localizing signs one is justified in performing a spinal puncture. The reading of the spinal pressure indicates the degree of intracranial pressure. Spinal drainage may prove effective in controlling the intracranial pressure. On the other hand, if the spinal pressure is not particularly increased, the pulse is not slowed and the respirations are not stertorous, one need not be greatly alarmed and the so-called do nothing treatment may be the advisable course to follow.

However, if signs of increasing intracranial pressure appear the course of dehydration should be followed. It consists of employing limitation of fluids to 1,000 cc. for the first twenty-four hours, the administration of magnesium sulfate by enema, dissolving 2 ounces of salts in 4 ounces of water, to be followed by intravenous

administration of 50 cc. of 50 per cent solution of glucose or sucrose. Unfortunately the effects of intravenous administration are only transitory and last for four to six hours. A repetition of the intravenous administration may be required during the first forty-eight hours. After the first twenty-four hours, I prefer to administer the glucose in 20 per cent solution in physiologic saline in quantities of 500 cc. repeated twice or three times daily.

The dehydration measures are supplemented by repeated spinal drainage if the two procedures give evidence of controlling the intracranial pressure, but it should be remembered that if the initial treatment of the cerebral edema by dehydration and spinal drainage is ineffective a large temporal decompression, or even a suboccipital decompression, should be resorted to. Though some surgeons prefer the decompression method for the control of cerebral edema, I prefer to give the dehydration and spinal drainage as a therapeutic test before resorting to surgical intervention, and I have also found that the dehydration may even supplement the effects of a decompression.

If the patient has not regained consciousness by the third day, one should be rather cautious about extending the dehydration too far, since the patient automatically dehydrates himself by the loss of fluid through respiration, perspiration and excretion. As a rule, we introduce a Rehffuss tube into the stomach by way of the nasal passages in order to administer 2,000 to 3,000 cc. of water and nourishment, and saline cathartics if we think it necessary to continue a moderate degree of dehydration. From the third day on until the patient becomes conscious, fluid and nourishment are administered through this tube in small quantities at hourly intervals.

The problem of controlling restlessness is very perplexing at times. I dislike the use of morphine, since it is a respiratory depressant. Codeine is rarely effective; the barbiturates are the most useful. Phenobarbital in rather large doses, grains $1\frac{1}{2}$ (0.1 gm.) every six hours, is usually sufficient. In the more violent cases, sodium iso-amylethyl barbiturate or pentobarbital is required. I dislike to restrain a patient and believe that it is less injurious to the patient to be narcotized by the more potent barbiturates than to be forcibly restrained by wrist and leg bands. In a few instances it has been necessary to administer sodium ethyl thiobarbiturate intravenously as an initial sedative.

CONVALESCENT TREATMENT

On the return of consciousness the physician too often concludes that the patient has recovered from his cerebral injury, but it should be remembered that if the patient is dismissed from hospital care before he has thoroughly recovered he will complain of headache, weakness, dizziness and nervousness, will become discouraged and will develop a series of fear complexes. Therefore, whether the patient remains in the hospital or returns to his home he should be kept under supervision and directed concerning his activities, his diet and rehabilitative measures. A patient who has sustained a serious craniocerebral injury should not be permitted to return to his regular work for from six to twelve weeks. He should be

encouraged to rest and sleep several hours during the day, be allowed to sit up but short periods at a time, take graduated exercises, and eat a well-balanced diet with the proper selection of vitamins and limitation of fluids to 2,000 or 3,000 cc. per day. Saline cathartics may be required to regulate his bowel habits for the first six weeks, following which he can depend on the proper selection of foods, including fruits, for the re-establishment of his bowel habits. If palsies have developed, physical therapy should be administered. Frequent assurances should be given in order that the patient may regain confidence in himself. In the event that irreparable damage has resulted from the craniocerebral injury, it becomes the duty of the attending surgeon to aid the patient in selecting a change of vocation and insurance adjustment, for if the surgeon is negligent in aiding the patient to rehabilitate himself the latter may become a permanent invalid instead of a useful or partly useful individual.

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Painless Ano-Rectal Surgery*

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PATIENTS with ano-rectal ailments are frequently afraid to consult a physician. The pain which they endure at stool makes them shrink from any new procedure, such as an examination or treatment. Many patients delay seeing a physician because some "would-be sympathetic friend" has told them about his or her "experience". Many times their experiences are told jokingly, and sometimes by physicians as well, but the story leaves a bad impression with the prospective patient. Treated patients never tell the public that the pain they have had postoperatively was no different than that which was present with each stool for weeks before coming to the doctor, and they usually also forget to say that they have actually been benefited by the operation. Fortunately, however, postoperative pains are much like labor pains: they are soon forgotten.

If rectal treatments and operations are properly done, the convalescent period should not be severe. I wish to present to you briefly some of the measures commonly used to make patients with ano-rectal complaints comfortable without subjecting them to a painful procedure. I prefer to tell patients that there is some discomfort incident to treatments or operation, and I prefer to have them tell their friends that the operation or treatment was not painless but that it was not severe. The prospective patient then does not expect the impossible. However, it does happen frequently that patients will go through complete courses of treatment or complete

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operative and convalescent periods and leave the hospital saying that they have had no pain.

No time will be devoted to the symptoms, the etiology, or the diagnoses of the conditions of which I will talk. I am assuming that a proper diagnosis has been made before treatment is started. The result of the treatment of any condition depends always upon a proper diagnosis having been established.

EXTERNAL THROMBOTIC HEMORRHOIDS

A thrombotic hemorrhoid is the result of the rupture of a blood vessel in the perianal tissue and occurs usually just beneath the skin at the anal margin. The thrombosis may be in one single area or many areas may be involved, and the swellings vary in size from a wheat kernel to a black walnut and are usually bluish in color. If covered with skin, they belong outside the anal canal, and no attempt should be made to push them into the anus or rectum. It usually comes on as the result of a strain. This may be incident to a hard stool, or a loose watery stool, or it may result from lifting or any sudden strenuous exertion. The tissues are less elastic than normal because of the presence of infection in adjacent crypts, and the tissues do not withstand normal stretching, therefore, there is a rupture of a vein in the tissues which produces the thrombotic pile.

The treatment will be described as palliative and operative treatment.

Palliative treatment consists in the application of diathane ointment which is definitely anesthetic to the

thrombosed area, the use of mineral oil by mouth, and the frequent use of heat either by hot sitz baths or by hot packs. You must not try to push an external thrombotic up into the anal canal or up into the rectum, and you should instruct the patient likewise. Many single areas of thrombosis are made multiple by an effort to push the pile into the rectum.

The palliative office treatment consists of having the patient come to the office for treatment each day as long as pain or tension at the anal margin persists. You should apply with a small applicator the tincture of merthiolate. Wait a short interval and then apply a generous helping of diothane ointment. This is especially true of small thrombosed areas which vary in size from that of a wheat kernel to that of a grain of corn. These small thrombosed areas should not be excised because the disability incident to their excision is often greater than if nothing at all was done. If the thrombotic pile is large and prevents the patient from sitting comfortably, it should be excised.

Many patients are seen with external thromboses which are very small, and we know that without any treatment they usually disappear, but these patients come for treatment, mental as well as physical, and you will do them an injustice if you tell them to go on and forget about it, as is frequently done. If you do not give them some form of treatment, their neighbors will immediately suggest a drug store remedy or, as most frequently happens, will send their name into some advertising clinic, and the patients will be deluged with literature which depicts cancer on every page, unless they come to this clinic immediately. Moreover, if patients buy the drug store remedies and are relieved (as they will be by most anything which they apply), they will refer their friends to the drug store, or if their pain persists longer than they think it should, they will be very apt to believe the cancer literature which they have received and will hie themselves away to some Mecca of magic cure and then come back boosting this organization because they did something for them. Patients must be treated mentally as well as physically. No matter how minor these lesions may be to you, they are of major importance to patients.

The operative treatment consists of the excision of the thrombosed veins. Attempts to aspirate the blood from these areas are frequently made, but it is not a good procedure. A simple incision into a thrombosed area should not be made because it will not evacuate the clots properly.

The method of excision consists of placing the patient on the side on which the thrombosis is located. The skin is painted with tincture of merthiolate, and 3 to 5 cc. of $\frac{1}{2}$ per cent novocaine without adrenalin are injected lateral to and beneath the thrombus, and finally a few minims are injected into the mucosal surface, above the clot, in the anal canal. This last injection will usually expose an infected crypt in that area. Sufficient time is allowed to elapse for the anesthesia to become effective. An elliptical incision is then made about the thrombus through the skin. The outer tip of the tissue to be excised is then lifted with a thumb forceps and a dissec-

tion with a sharp curved scissors is made beneath the thrombosed vessels, lifting them out in mass. Hemostasis is usually unnecessary, and these incisions should not be closed by suture. A wick of gauze or tape one-fourth inch wide and one-half inch long is laid in the incision to prevent sealing of the wound edges. If the edges are allowed to seal or if you suture the incision, you will have an accumulation of blood which will be as painful as the original lesion. Diothane ointment is applied locally, a pressure dressing is put in place, mineral oil is given by mouth twice daily, hot sitz baths are used the following day after stool and at bedtime, and a prescription is given for the diothane ointment for local application by the patient. After the excision these people should be seen each day until healed. They may return to clerical work on the following day and will be more comfortable than they were preceding operation.

After excision of an external thrombotic hemorrhoid, the patients should be told exactly what was done, that is, that an external pile was removed and that it will not prevent the recurrence of more and that it was only a palliative operation. Explain to them that it is not an operation for internal hemorrhoids and that there is always a possibility of a similar occurrence. Our failure to make this explanation to patients is the cause of them returning and saying that their pile operation has not been successful. Most of the patients who do return following an operation and state that they have a recurrence, do not, but their enlargement is due to the presence of hemorrhoidal tissue which was not removed previously. I see many patients who say their piles returned but who on examination have no evidence that anything other than a skin tag was ever removed.

FISSURE IN ANO

This is an anal ulcer or break at the anal margin and is usually situated in the mid line posterior but does occur anterior quite often in women and it is apt to give rise to urinary frequency and tenesmus. The usual symptoms of a fissure are anal spasm, pain at stool, and severe smarting and burning lasting from one to several hours after stool. A slight amount of blood is usually noticeable on the toilet paper. Free bleeding as with piles is unusual.

Palliative treatment: These patients want relief from pain, and many refuse to have any operative procedure and do not want to lose any time from work. In the past it was the custom to attempt to heal these fissures by the application of silver nitrate. Such treatment really does disable the patient, if he is not already so. Never apply silver, if you desire to make the patient more comfortable. It is your desire to obtain a form of treatment that will immediately make the patient more comfortable and will allow him to resume his duties at once. Local infiltration about the anus with $\frac{1}{2}$ per cent novocaine and a forcible stretching or "divulsion", as it is sometimes called, is often suggested, but the patient will not be able to return to work on the following day, although they are often told that there will be no pain following a "divulsion". Local incision of the fissure with relief of spasm can be done in the office but that

too will cause disability. However, the injection of an anesthetic in oil, which has a prolonged action, beneath the base of the fissure and into the sphincter muscle will give muscle relaxation and relief from pain for several days or weeks and will often allow a fissure to heal over a long period of time.

The method of injecting fissures with anesthetic in oil is as follows:

The patient is placed on his right side on the table with the knees flexed. The perianal region is painted with tincture of merthiolate. A small skin wheal is raised $1\frac{1}{2}$ to 2 inches posterior to the anal margin. A small amount of $\frac{1}{2}$ per cent novocaine is infiltrated into the perianal tissue and beneath the fissure. A 5 cc. syringe is then filled with the anesthetic oil solution and a $2\frac{1}{2}$ inch 18 gauge needle is used to inject the solution into the tissues.

The index finger of the left hand is inserted into the anus, and it is used as a guide for the injection of the oil into the muscle and under the fissure. Five cubic centimeters are distributed in a fan-shaped manner, being careful not to pool any of the solution and to not puncture the rectal wall. Occasionally the patient will have pain for fifteen minutes to one hour after the injection. On the following day he will usually return stating that he has had a stool without discomfort and that the sensation of pain and soreness has been relieved. Bleeding, however, may be present until the fissure heals.

The treatment which the patient is to carry out at home after the injection is as follows:

He is to take plain petrolagar, one ounce, morning and evening. He is to take a hot sitz bath after every stool and at bedtime. Diothane ointment is to be applied externally on cotton twice a day. All foods are to be cooked, and all fruit juices, carbonated drinks, milk, and soups are forbidden. The patient is encouraged to eat plenty of food of a solid nature because the stools are more satisfactory if plenty of bulk is taken. By following this regime, many patients obtain complete relief.

PERIRECTAL ABSCESSES

Perirectal abscesses are nearly all the result of crypt infection. They occur most frequently at the anal margin, in the ischioanal fossa, and submural. The treatment of them consists of adequate drainage which can only be provided when good anesthesia of some type is used. Inflammatory tissue is hypersensitive, so do not try to open abscesses with infiltration anesthesia. Sacral anesthesia, general anesthesia, or spinal anesthesia may be used. Sacral is my choice if there is no infection over or near the sacral hiatus. General anesthesia may be used if an infection extends up over the sacrum or if the patient prefers narcosis to a local block. Spinal anesthesia may be employed, using 35 to 50 milligrams of novocaine.

With adequate anesthesia you should open all abscess cavities so that the lining of the cavity is exposed in all areas, and the incision should be made so that the abscess cavity will lie open without packing. A few layers of

gauze may be left in the cavity to prevent coaptation of surfaces. Postoperative pain following the opening of a perirectal abscess usually means incomplete drainage of all the infected area.

Follow-up treatment of an abscess which has been incised is very much the same as that outlined for fissures. Hot sitz baths should be started on the day following incision and should be given twice a day until the wound is healed. The gauze dressing should be removed on the fourth or fifth day, and at that time it will come away without adhering to the tissues, while if an attempt is made to remove it earlier, there will be considerable pain and free bleeding on its removal.

Do not use any postoperative analgesia to be produced by injection of an aqueous or oil soluble anesthetic. With free drainage there should be no pain. With injection of oils into infected areas new abscesses may be initiated.

INTERNAL HEMORRHOIDS

The injection treatment of internal hemorrhoids: Injection treatment is indicated either for bleeding or protrusion or both. Uncomplicated internal piles do not produce severe pain, and when pain is present, one must suspect the presence of an inflammatory lesion. External thrombotic piles and thrombosed internal piles do produce pain, but the treatment has been outlined for the external thrombotic hemorrhoids, and thrombosed internal hemorrhoids should be operated and not injected.

DIAGNOSIS

The first thing to consider before treating any rectal condition by any means is: Have I made a correct diagnosis? For this reason, I wish here to suggest that every case which you propose to treat by the injection method have a thorough rectal examination, both digitally and with a speculum. Nothing can produce greater embarrassment to the physician than to discover that after treating supposedly bleeding internal hemorrhoids by injection or any other method that the patient has a carcinoma just a few inches above. This will not happen if the patient is properly examined previous to treatment; so first of all do not accept a patient's diagnosis of hemorrhoids and do not treat his hemorrhoids without an examination.

When the injection method is used in properly selected cases, it has many advantages to recommend its use: (1) Lack of any period of disability. (2) Results are almost immediate, the symptoms beginning to subside at once. (3) No anesthetic is required. (4) The expense should be less than that involved in an operative procedure. (5) In the hospital outpatient departments and clinics it is not necessary to hospitalize the patient. (6) It is a safe procedure with cases in which an anesthetic would be contra-indicated, such as: pregnancies, cardiac and renal patients, and elderly people. (7) There should be no after-pain. (8) Complications following treatment, if properly carried out, should be few and of minor importance.

SELECTION OF CASES

Cases for treatment must be selected with judgment and care in order to exclude unsuitable ones. After 21

years experience with both quinine and urea and carbolic, I would recommend the following grouping of cases.

First: The cases that are suitable for injection: These are internal hemorrhoids which are uncomplicated and are of the first and second degree in size. They must be soft, non-fibrous and reducible, and there must be no eversion of the anal margin. If this rule is observed in selecting cases, protrusion and bleeding should be relieved by injection treatments.

Second: The cases which are unsuitable for treatment: Fibrous internal hemorrhoids, polypi, enlarged papillae, enormous prolapsing internal hemorrhoids, interno-externo hemorrhoids or the type with a large skin tag which tends to drag down the mucosa. It may occasionally be permissible to treat this type in elderly individuals.

It is well to make these rules: Do not treat an internal hemorrhoid which prolapses immediately after being replaced, because the results are usually unsatisfactory. Do not inject hemorrhoids in the presence of a fistula. Do not inject hemorrhoids in the presence of a tumor. Do not inject external skin tags or thromboses, either acute or old. As a general rule, do not attempt to inject anal pathology in any patient who has pain at the time of or following stool or who has pain upon introduction of a speculum. In the first place, in the presence of infection, the results will not be satisfactory, and in the second instance, if the patient has pain upon the introduction of a speculum, you will not be able to carry out your treatment satisfactorily.

MATERIALS NECESSARY FOR INJECTION OF HEMORRHOIDS

Your lighting is best provided by a good head light or a spot light coming over the right shoulder. A lighted speculum may be used, but as a rule, the simpler the armamentarium the easier the procedure.

Anoscopes. You should have several anosscopes at hand. Tubular anosscopes of the Hirschman and Vernon David or Kelly types are the most satisfactory. They should be of sufficient caliber to give a good view and should measure 2 to 3 inches in length. Speculi with the lateral slots are not desirable, especially those of the Brinkerhoff and Goldbacher type, because hemorrhoidal tissue frequently becomes wedged firmly in the slot.

Syringes. A 3 cc. Leur precision long barrell syringe is my choice, and I use a bayonet extension which is about 2½ to 3 inches long and which assists materially in reaching through the anoscope.

The needle must be large enough in caliber to allow oily solutions to flow freely; so an 18 gauge, 1-inch, rust-proof needle is used. If desired a special hemorrhoidal needle with a guard may be obtained and used, but I have never thought it necessary to use a needle with a guard.

Solutions. Two solutions are in common use, phenol in oil, 5 or 10 per cent, most commonly known as P. & O., and quinine and urea, 5 or 10 per cent aqueous solution. The phenol in oil solution is prepared as follows: Take 60 grams of Merck's pure phenol crystals

and 60 cc. of Wesson cooking oil. This makes a 50 per cent stock solution. To prepare a working solution take 10 cc. of the stock solution and 90 cc. of Wesson oil and mix thoroughly. The solution is then ready to use.

Preliminary preparation of the patient. No dietary restrictions are necessary. The patient is asked to take a normal salt solution flush five or six hours before coming in for treatment so that the bowel will be empty.

Technique of injection. The patient is placed on his left side in an exaggerated Sims' position, as this position gives the best exposure. A well lubricated, large size, Hirschman speculum is then inserted into the anal canal, and it is turned before withdrawing the obturator so that the aperture of the speculum will expose the area to be injected. The position of the speculum should at no time be changed unless the obturator has been replaced. It is my custom to inject the largest pile first, and the site of injection for that pile should be at the upper pole. This area is visualized and painted with tincture of merthiolate. The needle is then inserted through the mucosa of the bowel at the predetermined point with the bevel of the needle turned toward the bowel wall. The mucosa is then lifted with the point of the needle to determine the depth at which your needle has been placed. The solution is then slowly injected. One should be able to see it spread evenly beneath the mucosa. A sufficient quantity of solution to produce a fairly prominent and somewhat pale swelling should be injected. If a blanching appears on the mucosa immediately upon injection, your needle is probably too superficial, and there will be a local slough if the injection is continued. In this event, the needle should be withdrawn and reinserted more deeply. The amount of solution to be injected will depend very much upon the redundancy of the mucosa at the upper pole. A very large pile will require as much as 3 to 5 cc. while smaller ones may require as little as ½ to 1 cc. Best results are obtained by large infrequent doses rather than by small repeated injections. Upon withdrawing the needle, a cotton applicator should be applied firmly to the point of injection in order to prevent leakage and to arrest bleeding and to assist uniform spreading of the solution. Following the injection, it is my custom to insert into the rectum ½ ounce of a 1 per cent diothane ointment immediately, in order to coat the surface and to allay pain which occasionally does occur.

After-care. If the patient is employed, it is best to have him come in at the completion of his day's work so that he may go home and lie down following the treatment. He is usually asked to lie quietly for ten minutes following the injection, after which time he is allowed to leave the office. He is then instructed to go home and lie down for an hour and is advised to avoid any strenuous exercise. If a treated pile should prolapse, the patient is advised to immediately replace it as strangulation might occur. Mineral oil is given by mouth on the day of the treatment and on the following day in order to obtain a soft oily stool, and the bowels are allowed to move whenever they have the inclination.

Pain. This usually does not occur, but the exception is the rule. It is ordinarily produced by injecting the

solution too near the anal margin. Other than the use of the diothane ointment following the injection as suggested, I depend upon a capsule containing aspirin 10 grains, phenacetin 3 grains, and caffeine 1 grain. If pain continues after lying down, a hot water bottle or an electric pad may be applied. It is seldom necessary to use morphine.

Frequency of injection. Only one pile should be injected at a sitting. Intervals of five to ten days between injections should be observed, and from four to six injections, if properly given, will usually suffice to effect relief. More frequent and numerous injections may occasionally be used, but the best results are usually obtained by the above procedure. A record must be kept of the areas injected so as to proceed in an orderly manner. The usual order of procedure is the right anterior quadrant, then the left lateral, and then the right posterior, and this is followed by injecting the mid-line posterior. After this, any remaining redundant areas are injected, and the injections are continued until all redundancy has been obliterated.

It is impossible to guarantee that injection or operation, for that matter, will be permanent and will withstand the ravages of time, such as: constipation, diarrhea, confinements, hard manual labor, and frequent enemas given postoperatively and during severe illnesses. However, the average patient is relieved from most of his symptoms, that is, from bleeding and prolapse over a period of three or four years, and if there is a recurrence, treatment may be repeated.

Complications. Chemical sloughing and necrosis does occur when too much solution is used or when too concentrated a solution is used or when injection is too superficial or when injected into dense tissue or beneath the skin tissue. I have seen one fatal result and several severe hemorrhages following sloughs, so you will see that this method is not without some danger. A careful follow-up of your cases should assist in the detection of impending complications. Patients should be instructed to report to you the passage of blood in any quantity. If this should happen, your rest will be less disturbed if you will go and see the patient and satisfy yourself as to the source and as to the quantity of the blood being passed. If bleeding is free, the patient must be hospi-

talized and the bleeder definitely located so that it can be completely controlled by ligature. Abscesses following injections may occur and must be treated the same as any peri-rectal abscess is treated.

RESULTS TO BE EXPECTED

When your patient came in, he was either complaining of bleeding or protrusion or both and frequently of aching in the rectum and of backache. If he was complaining of a great deal of pain, he was not a suitable type of patient for injection. This type of patient is also usually constipated, so the results to be expected from treatments are as follows: his constipation should be relieved and there should be no bleeding or protrusion. If a satisfactory result has been obtained, the patient will empty his bowel completely, he will have less distension in his abdomen, he will have less gas, he will probably state that he has less "stomach trouble," and he may be able to dispense with the use of soda following meals.

If you are able to relieve all of these symptoms by the injection method, there is no reason why surgery should be used in any case. However, the results from this method of treatment, as before stated, are not always permanent.

When large prolapsing internal hemorrhoids are present and when thrombosed internal hemorrhoids are present, an operative procedure is indicated. The ideal operation is one in which the complete removal of hemorrhoidal tissue is accomplished and the normal function of the part is preserved or restored and the operation assures the earliest recovery of the patient and affords the minimum of pain and discomfort postoperatively. To attain this, I suggest the use of the ligature operation which removes excess tissue only, which does not produce any contracture if properly done and which is comparatively easily executed.

Operations for hemorrhoids employing a cautery should be abolished because the cauterization of hemorrhoidal tissue produces excessive amounts of scar tissue and scar tissue produces contracture, and these patients do not then have adequate emptying space. Their convalescent period is retarded, their results are unsatisfactory, and rectal operations are again considered valueless.

Brucellosis (Undulant Fever)*

A Brief Review with Case Analysis

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I. NOMENCLATURE AND HISTORICAL ASPECTS OF BRUCELLOSIS

BRUCELLOSIS, more commonly referred to as Undulant Fever, has probably afflicted mankind for many centuries. Its existence in the Island of Malta was noted throughout the nineteenth century by British medical officers. Establishment of the disease as a definite entity followed the discovery of the etiological agent by Bruce¹ in 1886. With subsequent development of diagnostic laboratory procedures the recognition of cases of brucellosis was facilitated.

The widespread distribution of the disease has only become apparent in the last few years. Several factors account for the previous failure to recognize existing cases. Lack of knowledge of the protean clinical manifestations which human brucellosis may present has perhaps been the most important one. Bacteriologists in this country were among the first to suspect the existence of the disease here and directed the attention of clinicians to it. Although the disease will eventually fall under control either through adequate methods of treating existing cases or through prophylaxis, it remains at the present time a disease of considerable importance. Difficulties encountered in the recognition of brucellosis are manifold but are no more so than are those encountered in its treatment.

The story of the evolution of a satisfactory name for the disease is in itself an historical account of the malady. It was probably a disease of antiquity for Hippocrates has described fevers which include all the features which we now recognize as characteristic of brucellosis. As mentioned, British officers stationed in Malta described the disease as early as 1800. This early geographical distribution was responsible for the name Malta fever. The occurrence of cases in other Mediterranean areas accounts for the synonymns, Gibraltar fever, Mediterranean fever, and Mittelmeer fieber. In 1887 the name, "Malta fever," was replaced by one more descriptive, "Undulant fever." Though this was more desirable in that it removed the geographical restriction, it was not wholly adequate since many of the cases, particularly those now seen in the United States, are not characterized by undulating febrile periods.

In 1886 David Bruce demonstrated the etiological agent of the disease by the isolation of a micrococcus from the spleen of a British soldier dying of Malta fever. This organism Bruce termed *micrococcus melitensis*, a name which remained in usage until recently. Ten years later Wright and Semple² devised the specific agglutination test which has since become of great usefulness as a diagnostic aid.

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At about the time Bruce and his co-workers were solving the problem of Malta fever, another contribution was made to the knowledge of this widespread but as yet unrecognized disease. Bang, a Danish investigator, studying the problem of contagious abortion in cattle, called attention to the occurrence of minute cocci in the exudate of the uterine wall of a cow with threatened abortion. Further study then established this as the etiological agent in contagious bovine abortion, known thereafter as the *bacillus abortus* of Bang. Confirmatory studies were subsequently made in this country by Theobald Smith. Later Traub,³ an American investigator, studying the problem of contagious abortion in hogs, isolated a causative organism which differed but slightly in its characteristics from the one described by Bang. It was recognized that these two organisms were probably varieties of a single species. It was not appreciated, however, that they could produce disease in man, nor was their relationship to the causative agent of undulant fever recognized.

In 1918, Evans⁴ called attention to the close morphological and cultural similarities of the *micrococcus melitensis* of Bruce and the two agents responsible for contagious abortion in domestic animals. In her report, she stated that "it would seem remarkable that we do not have a disease resembling Malta fever prevalent in this country." The first case in the United States recognized clinically as undulant fever and proven by bacteriological methods to be due to *bacillus abortus* was reported by Keefer in 1924.⁵ A similar case report by Duncan⁶ appeared from England the following year. It gradually became apparent then that undulant fever was not limited to the Mediterranean littoral, but was world-wide in its distribution. Three causative organisms, all varieties of a single species, were likewise recognized depending on their origin from goats, cows, or hogs. The multiplicity of names awarded to the disease and to its etiological agents has led to some confusion. Meyer⁷ in 1920 suggested the generic name *Brucella*. This term has enjoyed uniform acceptance. A desirable classification would seem to be that followed by Evans and listed by Hardy⁸ as:

Brucella melitensis var. *melitensis*—caprine origin.

Brucella melitensis var. *abortus*—bovine origin.

Brucella melitensis var. *suis*—porcine origin.

As a consequence of the renaming of the organism with the generic name *Brucella*, the name undulant fever should be omitted and the disease called brucelliasis or brucellosis. The latter appears preferable and is most widely used today.

II. ETIOLOGY AND DISEASE INCIDENCE

The brucellae are small, Gram negative, non-motile

organisms. They commonly exhibit pleomorphism, and coccoid forms usually predominate in animal tissues. Growth on artificial media is slow. Strains of bovine origin require an atmosphere of 10 per cent carbon dioxide for growth. Differentiation of the three varieties of brucella is difficult but is accomplished by agglutination tests with specific immune serum, by agglutination absorption tests, by the effects of certain dyes on the growth of the organism when added to culture media, and by the carbon dioxide requirement for growth. Most strains are pathogenic for man, for the common laboratory animals, and for such domestic animals as cattle, hogs, horses, goats, and sheep. The disease is a most serious one for cattle, ranking second only to tuberculosis. Infected animals often exhibit no evidence of the disease, hence recognition other than by the occurrence of abortions and premature births is difficult.

Figures for the incidence of the disease in the state of Minnesota for the past eleven years are available. This data, prepared by the Division of Preventable Diseases of the Minnesota Department of Health, is shown in Table 1.

TABLE I.
Undulant Fever in Minnesota
(Minnesota Department of Health, Division of
Preventable Diseases)

	MALE		FEMALE		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
1927	6				6	
1928	10		2		12	
1929	33		9		42	
1930	43		19		62	
1931	57	2	15		72	2
1932	50	1	12	2	62	3
1933	56		16		72	
1934	78		24	1	102	1
1935	92	2	22	1	114	3
1936	57	2	20		77	2
1937	65	4	23	1	88	5
1938	71		14		85	
Total	618	11	176	5	794	16

The distribution according to sex shows a preponderance of cases in males, the ratio being about three to one, a figure which is in agreement with most of the available data. An analysis of the 794 Minnesota cases shows the highest incidence of the disease in the male to occur between the ages of 25 to 34 years.

Epidemiological studies of the reported cases indicate a definite relationship between the incidence of the disease and certain occupations, namely, farmers, packing plant employees, housewives, and domestic help.

The determination of the probable sources of infection in cases of brucellosis is difficult because of the often insidious onset of the malady and the relatively late diagnosis. Factual evidence, however, implicates the ingestion of raw milk, contact with infected animals, and the handling of infected meat as the most frequent sources.

In 1936, Kabler and MacLanhan⁹ reported that Brucella strains isolated from human cases in Minnesota showed twice as many to be of porcine origin as of bovine origin. This would indicate that the hog is the source of more cases of human brucellosis in Minnesota

than cattle. This coincides with the conclusions of Hardy and his associates in Iowa.⁸

III. SIGNS AND SYMPTOMS

In the majority of cases an accurate estimate of the incubation period is difficult because of the multiplicity of exposures and the difficulty in detecting the exact onset of the disease. Most observations place the period of incubation to be between ten and twenty-one days. Information regarding this point is available from the studies of Otero¹⁰ in experimentally produced infections in human volunteers. In this manner incubation periods were found to vary from ten to sixteen days.

The mode of onset of clinical brucellosis may be sudden or insidious. Clinical symptoms resembling acute respiratory infections are not uncommon, and diagnoses such as "la grippe," "influenza," or "intestinal flu," are often made. Varying degrees of lassitude and weakness are present early in the course of the illness in at least one-half of the cases.

The common symptoms and signs together with the relative frequency is excellently summarized in a concise table by Hardy⁸ based on an analysis of 300 case studies in Iowa. Outstanding in all cases is weakness, which in the mild cases may frequently be the only subjective complaint. Sweating, moderate to profuse, is experienced by a majority of individuals who contract the disease. A peculiar sweetish fetid odor to the perspiration has been reported by some observers. Chilliness, often a symptom observed during the period of invasion, frequently persists and ushers in the daily rise of temperature seen in the more severe cases. Pain usually takes the form of a generalized malaise and tends to persist in the ambulatory patient and to be aggravated by exercise. The pain when it is localized, is generally manifested by headache, arthralgia, lumbar pain, or abdominal pain. The latter may be prominent and has in more than one instance led to erroneous surgical diagnosis. Gastro-intestinal disturbances usually take the form of anorexia and constipation. Diarrhea is rare. Of the exhibited neurological disorders, insomnia, restlessness, and irritability are most common, while delirium and coma are rare. Cough, often productive of mucopurulent sputum, is present in about one-third of the cases.

Physical Observations. The general appearance of patients ill with brucellosis is variable. Many of the patients do not appear acutely or even chronically ill. Even the acutely ill remain mentally alert and lack the dullness so frequently seen in typhoid fever. There is a remarkable absence of physical signs for an infection so widely disseminated throughout the body. Pallor, abdominal tenderness, and splenomegaly are the most frequently reported positive findings. Skin eruptions are usually confined to early cases and are seldom characteristic. Fever, present in all cases at some time, is frequently out of proportion to the degree of prostration. The pulse rate is often relatively slow in proportion to the fever. Low blood pressure is not an infrequent finding, especially late in the disease.

Clinical Types of Human Brucellosis. The variable febrile responses exhibited by patients ill with brucellosis permits classification on a clinical basis. The types usually listed are the intermittent, the undulatory, the malignant, the ambulatory, the subclinical, and the chronic forms. The latter three are of particular interest because of the ease with which they may escape detection or may simulate some other condition. The chronic form deserves special mention because appreciation of its existence has developed only within recent years. Such cases may emerge from typical febrile forms of the disease but frequently the initial illness is atypical in character. Asthenia, nervousness, lack of emotional control, and melancholia are characteristically present in this form. Temperature elevations are frequently low grade, and there may be long intervening afebrile periods.

IV. DIAGNOSIS

A. *Clinical.* Recognition of typical cases is not difficult. Frequently, however, the clinical picture is atypical in nature. The disease should be considered in any patient with fever of obscure origin; in patients with unexplained splenomegaly; in individuals exhibiting weakness, vague muscle and joint pains unaccounted for by demonstrable pathology; and in persons with neurasthenia. Among the diseases with which brucellosis is confused are tuberculosis, typhoid fever, malaria, influenza, subacute bacterial endocarditis, and arthritis.

Confusion with acute appendicitis or cholecystitis may arise in cases where abdominal tenderness is prominent. The actual production of acute cholecystitis by brucellae has however been noted. In a well studied case reported by Mettier and Kerr¹¹ hepatitis and cholecystitis were observed. Removal of the infected gallbladder was followed by apparent clinical cure.

B. *Laboratory Diagnosis.* There is probably no other infection of man at present in which laboratory aid is so necessary to establish the diagnosis as in brucellosis (Butler¹²). The absence of a leucocytic response in practically all cases of brucellosis is a characteristic feature. True leucopenia is encountered in a half or more of the cases and an absolute lymphocytosis is frequently observed. The sedimentation rate of the erythrocytes is usually normal, a finding exceptional among infectious diseases (Curschmann—quoted from Riemann¹³). An anemia of mild degree is present in many cases, particularly those of long standing.

(1) *Serological Procedures.* Two serological tests devised for use in the detection of brucella infection are the agglutination reaction and the complement fixation test. The latter has, however, proved to be of no advantage over the simpler agglutination test and has consequently fallen into disuse. As in any laboratory procedure, limitation of its value must be kept in mind in interpreting the results. In general, a positive agglutination in a dilution of 1 to 80 or higher has clinical significance. The following must, however, be kept in mind: (1) mild or subclinical brucellosis does occur and may at times be associated with other diseases; (2) specific agglutinins may persist in the blood, though the tendency

is toward disappearance coincident with clinical recovery; (3) infection may occur without the production of any demonstrable agglutinins. Such cases, proven by isolating the organisms from the blood stream of patients, are sufficiently common to warrant careful interpretation of negative agglutination tests if the clinical picture is at all suggestive of brucellosis. Cross agglutination reactions with *B. tularensis* are occasionally seen in sera having high agglutination titres for *br. melitensis*. Such cross reactions occur in low dilutions only and are seldom confusing (Francis and Evans¹⁴).

The agglutination reaction in brucellosis may become positive by the fifth day and is usually positive by the fifteenth day of the disease. Positive agglutinins are rarely not evident until the third or fourth week of the disease (Simpson¹⁵). Active tissue invasion by the bacteria is required for the development of agglutinins in humans. Passive absorption of such agglutinins through the gastro-intestinal tract does not occur. (Carpenter, Boak, and Chapman¹⁶).

(2) *Blood Culture in the Diagnosis of Brucellosis.* While the agglutination test has the advantage of simplicity and rapidity, it offers evidence that infection either past or present has occurred, but gives no indication as to the type of the offending organism. It suffers the added disadvantage that early in the disease agglutinins are not formed and, more important still, that in some cases they may never appear. The isolation of the organism from the blood stream enables its exact nature to be determined and leaves no doubt that the patient's illness is due to the organism. The absence of bacteremia in some cases limits the usefulness of the method. Butler, an authoritative student of the blood culture method, believes that 80 per cent of patients infected with brucella melitensis will yield positive cultures if the sample is taken at the optimal time during the course of the illness. That such a high percentage of positive results can be obtained in the infections due to the abortus strains of bovine and swine origin, such as are seen in this country, is uncertain. It is probable that some of the failure to demonstrate organisms in cases described in the United States have been due to faulty technique rather than the absence of bacteremia. Three factors are important from a technical standpoint: (1) blood should be drawn when the temperature is high or when a pyrexial wave is beginning; (2) specimens must be incubated for a long time, and (3) two incubation methods must be used. An atmosphere of 10 per cent carbon dioxide is needed for the growth of *Brucella melitensis* var. abortus. The growth of the other two strains appears to be inhibited by such atmospheric conditions. Therefore, both methods should be used in the attempt to isolate organisms from the blood stream.

(3) *Animal Inoculation.* Blood, milk, or extract of tissues suspected of harboring the organism may be injected into guinea pigs either subcutaneously or intraperitoneally. After six weeks the animals are killed. An agglutination test for brucella is done with the blood, and the viscera are examined for the characteristic

lesions. Specimens of spleen, liver, and lymph nodes are placed in culture media in an attempt to isolate brucellae.

(4) Cultures of Urine and Feces. Brucellae have been cultured but very few times from the urine of infected human beings. Very few workers have been successful in isolating the organisms from the feces though Amoss and Poston¹⁷ with the employment of a special technique have on occasions been able to do so. Isolation of brucellae from the gallbladder, the spinal fluid, and the brain of infected human beings have been reported.

(5) Skin Test as a Diagnostic Aid. Skin tests as a means of detecting brucella infection in cattle using an antigenic agent prepared like mallein and tuberculin were first used by McFadyean and Stockman in 1909¹⁸. Many workers have since studied the value of various intradermal tests in humans. The intradermal injection of 0.1 cc. of a suspensoid of nucleoprotein (1:2000) isolated from brucella organisms has been extensively employed by Huddleson. An injection of 0.05 cc. of a suspension of heat-killed brucella abortus has been found to be satisfactory as a routine procedure. The site of the injection is examined 48 hours later in interpreting the test. The reaction may be graded as in the tuberculin test. Doubt as to the value of the test has been raised because of the finding of positive reactors among people without evidence of the disease. Heathman and her associates¹⁹ found 8.7 per cent positive reactors among a group of 161 healthy hospital employees, all of whom had negative agglutination reactions. On the basis of an extensive survey for evidence of brucella infection using both the intradermal and agglutination test, Heathman was led to conclude that perhaps a negative skin test was more valuable as a diagnostic aid than was a positive one. This view is shared by other writers on the subject. All concede that the test is the most delicate indicator of previous infection or exposure and the presence of a negative reaction will serve to rule out brucellosis in nearly all cases.

(6) Opsono-Cytophagic Test. Using a modification of the Lieshman-Veitch technique, Huddleson²⁰ has devised a method for determining the opsono-cytophagic power of blood for brucella. The test is performed by incubating a mixture of a live 48 hour old culture of brucella abortus and the patient's citrated blood for 30 minutes at a temperature of 37°C. A smear of the mixture is then made and stained. Twenty-five polymorphonuclear leucocytes are examined and their opsonic power classified according to the number of brucella organisms counted within each cell. The classification suggested is as follows:

Negative—none.

Slight—from 1 to 20 per cell.

Moderate—from 21 to 40 per cell.

Marked—over 40 per cell.

Attempts have been made to correlate this test with the intradermal reaction and the agglutination titre to determine whether or not a given patient is immune, susceptible, or infected. Insufficient data is available as yet to make a final evaluation of this diagnostic aid.

Certain disadvantages inherent in the test, chief among them being the requirement of young living cultures, limits its scope of usefulness.

V. TREATMENT OF BRUCELLOSIS

The evaluation of the effectiveness of therapeutic agents used in any disease is unsatisfactory because of the difficulties inherent in the analysis of clinical data. For several reasons this is particularly true in brucellosis. The frequent occurrence of spontaneous remission or recovery is well known. Then, too, the diagnosis in any given case must be critically analyzed since it may rest only upon the presence of a positive agglutination reaction without due consideration being given to the fact that this may be the residual of some past subclinical infection. A comprehensive review of therapeutic methods was published by Carpenter and Boak²¹ in 1936. Critically analyzing the entire literature available on the subject, they concluded that no therapeutic agent had been developed up to that time, which proved to alter the natural course of the disease to any significant degree. A survey of many reports revealed the rather noteworthy agreement as to the duration of the disease. The average figure reported was three months, an average which appeared fairly constant in treated and untreated cases alike. The multiplicity of agents and methods so far employed in the treatment of brucellosis attests to the ineffectuality of them.

A. *Vaccine Therapy.* The use of a stock or auto-genous vaccine has been the most widely employed form of treatment. Interval injections, using graduated dosages has been reported by many but with irregular results. Best results appear to have been obtained when a systematic reaction followed the injection. The intravenous administration of such preparations is followed by marked systemic reaction and defervescence is said to occur with coincident clinical improvement. Carpenter concluded that beneficial results were in all probability related to the production of "shock" and that considerable danger existed in the employment of such measures.

B. *Serum Therapy.* Human convalescent serum and various animal antisera have been fairly extensively employed but the majority of reports are based on a small series of cases. Wherry and his associates²² were favorably impressed with the results of the administration of a serum prepared from goats. Because of the apparent lack of potency of this preparation, they have suggested the preparation of a horse serum. The administration of human convalescent serum has been reported as being of beneficial, though sometimes temporary, effect. Poston^{23,a,b} has recently reported successful treatment of three cases by this method.

C. *Toxic Filtrates Used as Therapeutic Agents.* Filtrates prepared from broth cultures have been used by a few investigators. Here again beneficial results were noted only when the patient exhibited a marked systemic reaction. In view of the occasional severe local reaction from such preparation when used as a diagnostic skin test, their employment as a therapeutic agent seems unjustifiable.

D. *Foreign Protein Therapy.* Many non-specific foreign proteins, designed to produce "shock" have been used in the treatment of brucellosis. Most extensively employed are the vaccines prepared from the typhoid group of bacilli. Administration by the intravenous, intramuscular, and subcutaneous routes have been reported by Budtz-Olsen,²⁴ Simpson,¹⁵ Miller²⁵ and others. The results (dramatic in some cases) appear most favorable in patients manifesting marked constitutional reactions. Benefit can apparently be expected in about one-half of the cases. Less satisfactory results are reported following the injection of sterile milk (Awe and Palmer,²⁶ Simpson¹⁵).

E. *Therapy with Artificially Induced Fever.* This method has been resorted to in a relatively small number of cases. The fact that cures are reported supports the contention that the febrile reaction is an important one in combating brucellosis. It has been suggested that in the chronic form of the disease, the body has lost the power to respond to the infecting agent by the development of an adequate fever. An encouraging report as to the value of artificially induced fever has recently come from the Mayo Clinic. Prickman, Bennet, and Krusen²⁷ have reviewed the results obtained in a series of 18 cases. The Kettering hypertherm was employed for the production of fever. Cures were reported in 15 of the 18 patients. Prickman considered this type of therapy is indicated and most efficacious in the acute or subacute febrile stage of the disease.

F. *Chemotherapy.* Carpenter and Boak found reports of chemotherapy used in 75 cases of brucellosis prior to 1936. Among the substances used because of their supposed bacteriostatic results were methylene blue, mercurochrome, acriflavine, and methyl violet. The routes of administration were variable but the results uniformly poor. The administration of neoarsphenamine has been reported by many European investigators. Wainwright²⁸ in this country, has recently reported favorably on its use in a small group of patients. Prior to the introduction of sulfanilamide as an agent in the treatment of brucellosis, no drug or chemical had been found which appeared to alter favorably the course of the disease with any degree of certainty.

First reports indicating favorable results in the treatment of brucellosis with compounds of the sulfanilamide group of drugs appeared in 1936 from French sources. Similar reports appeared the following year from Germany (Blumgart²⁹). Early in 1938, results of five cases of brucellosis successfully treated with sulfanilamide appeared in the British medical literature (Lloyd,³⁰ Richardson,³¹ Francis³²). In vitro studies by one of these British investigators (Francis³²) revealed that the drug was bacteriostatic for brucella. Similar results were noted by Chinn³³ when he observed the drug in a concentration of 1 to 1000 killed the organisms. In higher dilutions the drug was found to be bacteriostatic but not bactericidal. Guinea pigs receiving the drug were found to be protected against infecting doses which caused the disease in the untreated controls. Confirmatory studies have been recently reported by Menefee and Poston.^{23c}

Sulfanilamide as an agent in both the treatment and diagnosis of brucellosis has been recommended by Welch and his associates.³⁴ They found that the drug increased the opsono-cytophagic activity for brucella both in infected animals and in human cases of brucellosis. Clinical reports indicating that cures can be obtained in this disease by the use of sulfanilamide have recently appeared from many sources in the United States (Stern and Blake,³⁵ Blumgart,²⁹ Traut and Logan,³⁶ Toone and Jenkins,³⁷ Bartels,³⁸ and others). It has been demonstrated that under this form of therapy bacteremia will disappear, fever will abate and clinical improvement will occur. Recently less favorable results have been reported by Byum.³⁹ In a series of six cases treated with maximal dosages of sulfanilamide, failure to duplicate the satisfactory results of other investigators was noted. Final evaluation of the effectiveness of the drug must, of course, await more widespread clinical investigation. At the present time, a trial of the drug in cases of human brucellosis appears justifiable.

REVIEW OF CASES OBSERVED AT THIS HOSPITAL

In the past ten years, 25 proven cases of brucellosis have been studied at the University of Minnesota Hospitals. Data from the records of these cases has been arranged for analysis as shown in the following tables (II, III and IV). The distribution as to sex, age, and occupation, the probable source of infection, as well as the observed signs, symptoms, and laboratory findings, agree fairly well with those reported for more extensive

TABLE II.
An Analysis of 25 Cases Observed at the University of Minnesota Hospitals for a 10 Year Period (1929 to 1939)

1. Sex Distribution:	
Females	6
Males	19
2. Age Distribution:	
Average	33 years
Range	12 to 62 years
3. Symptom Duration Prior to Admission:	
Average	4 months (approximately)
Range	2 days to 7 years
4. Length of Hospital Stay:	
Average	35 days (23 cases)
5. Probable Source of Infection:	
Raw milk ingestion	10 cases
Contact with aborting cows	6 cases
Not determined	9 cases
6. Occupation:	
Farmer	11 cases
Laborer	5 cases
Student	2 cases
Nurse	2 cases
Housewife	2 cases
Salesman	1 case
Physician	1 case
Child	1 case

TABLE III.
An Analysis of 25 Cases Observed at the University of Minnesota Hospitals for a 10 Year Period (1929 to 1939)

1. Symptoms Observed:		2. Signs Observed:	
In order of their frequency.			Cases
1. Weakness		1. Fever	20
2. Chilliness		2. Splenomegaly	12
3. Sweating		3. Weight loss	6
4. General Aching		4. Pallor	5
5. Headache		5. Cardiac Diseases	2
6. Cough		6. Abdominal tenderness	1
7. Anorexia			
8. Constipation			
9. Nervousness			
10. Backache			
11. Arthralgia			

investigations. Table V, showing the various diseases considered in the process of arriving at a correct diagnosis, presents an impressive list of clinical disorders. It serves to emphasize the atypical character of many of the cases.

TABLE IV.

An Analysis of 25 Cases Observed at the University of Minnesota Hospitals for a 10 Year Period (1929 to 1939)

Laboratory Studies:	Cases
1. Anemia:	
Hemoglobin below 70 per cent	3
Hemoglobin 70 to 80 per cent	7
2. Leucopenia:	
Leucocyte count below 5,000	12
3. Lymphocytosis:	
Absolute	3
Relative	11
4. Agglutination Studies:	
Positive at one time	24
Negative at one time	7
a. Early	5
b. After recovery	1
c. Persistently negative	1
5. Skin Test:	
Positive	16
Not performed	6
Negative	3
a. Endocarditis	2
b. Early case	1
6. Blood Culture:	
Positive	1
Negative	18

TABLE V.

An Analysis of 25 Cases Observed at the University of Minnesota Hospitals for a 10 Year Period (1929 to 1939)

1. Diseases considered in establishing the diagnosis:		
1. Tuberculosis	in	8 cases
2. Typhoid fever	in	6 cases
3. Hodgkin's disease	in	5 cases
4. Subacute bacterial endocarditis	in	3 cases
5. Tularemia	in	2 cases
6. Malaria	in	2 cases
7. Pyelonephritis	in	2 cases
8. Influenza	in	2 cases
9. Tuberculous peritonitis	in	1 case
10. Banti's disease	in	1 case
11. Felty's disease	in	1 case
12. Chronic sinusitis	in	1 case
13. Septicemia	in	1 case
14. Empyema	in	1 case
15. Unresolved pneumonia	in	1 case
16. Lung abscess	in	1 case
17. Pleurisy	in	1 case
18. Psychoneurosis	in	1 case
19. Infectious mononucleosis	in	1 case
20. Bronchitis	in	1 case
21. Chronic arthritis	in	1 case
22. Bronchiectasis	in	1 case
23. Appendicitis	in	1 case
24. Cholecystitis	in	1 case
25. Diaphragmatic pleurisy	in	1 case
26. Liver abscess	in	1 case

TABLE VI.

Treatment and Results in 23 Cases

Type	Number Improved	Not Improved
a. Symptomatic	12	9
b. Brucella vaccine	4	4
c. Sulfanilamide	3	1
d. Typhoid vaccine	1	1
e. Convalescent serum and typhoid	1	1
f. Typhoid and brucella vaccine	1	1
g. Sulfanilamide and brucella vaccine	1	1

Evaluation of the effects of treatment, as may be seen from the results in 23 cases (table VI) is difficult. Of 12 cases receiving only symptomatic therapy, 9 improved; of 11 receiving measures thought to be more or less specific for the disease, 7 showed improvement, 4 did not.

One death is recorded in the series, that of a male presenting the clinical picture of brucellosis and bacterial endocarditis. Autopsy studies confirmed the clinical impression. Pure cultures of brucellae were obtained from the cardiac valve vegetations, the spleen, and the lungs.

SUMMARY

A brief review of the disease brucellosis is presented. A small series of cases observed at this hospital has been analyzed according to age and sex and the clinical diagnostic and therapeutic difficulties considered. The renewed interest in chemotherapy in recent years appears to offer hope that an effective agent will be found to combat the disorder. The limited experience with sulfanilamide in brucellosis to date suggests that the drug will prove to be more satisfactory in treating early cases than those which have reached the chronic stage of the disease.

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Opportunities for Mental-Emotional Health Guidance for Atypical Cases

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Introduction

I AM taking the liberty of interpreting "restricted and remedial" to mean atypical, or those commonly known as deviating from the normal. Many of these atypicals have structural or functional deviations which may be accompanied by mental-emotional disturbances. (The group of which I am speaking includes approximately 10 per cent of the average student body.) There is first the question of how many structural conditions found among the atypical are amenable to correction by exercise alone. There is also the question of why we should restrict these opportunities to the atypical. Many so-called normals have these same problems although to a lesser degree.

MENTAL-EMOTIONAL HEALTH DEFINED (as a working hypothesis only)

A state of adequate internal adjustment as well as adequate external adjustment or adjustment to one's environment. That is, the demands from *within* (the self) are adequately satisfied, and the pressure from *without* (the environment) finds the individual possessing the capacity and skill necessary to deal successfully with new situations.

GUIDANCE

If we are to give guidance which will produce this mental-emotional health, we must understand the needs of the atypical. As educators we must understand what

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education is trying to accomplish and then determine, in the light of individual deficiencies or needs, how we can contribute to the satisfaction of these needs.

NEEDS

What does the individual need in order to attain functional effectiveness in our society and, at the same time, be reasonably happy?

Three large groups of needs are commonly noted.

1. Organic or physiological health.
2. Social health (environmental factors).
3. Mental-emotional health.

Organic Needs. These may be listed largely as physiological or tissue needs, such as food, rest, activity, and other needs, which arouse persistent types of behavior. One of the outstanding needs today is biological. By this I mean the need for activity which will improve our organic and skeletal systems. There is great need for expression along socially improved lines of our biochemical mechanism. Modern living with its insecurity and increased tension calls forth complicated biochemical responses which are restricted by conventional standards. The nature of man's problems has changed, but his bio-chemical mechanism still prepares him for an action which does not take place, for an action which must be suppressed. Situations which arouse anger cause the adrenal cortex to throw adrenalin into the blood, glycogen to be released from the liver, and the spleen to release extra red blood corpuscles, but the fortified action which should result from these secretions must,

because of conventional standards, be suppressed. The result is internal conflict. Individuals need a type of activity which will use these secretions, or their insidious effects may lead to ill health. As the drive for activity awakens other drives, this drive must be given expression.

Social or Status Needs. Adequate social adjustment means social efficiency. Here again certain drives must be satisfied such as affection, security, prestige, "likeness to others," and belongingness. Characteristics which sharply differentiate a person from others, unless they be applauded by society, are a handicap and a hazard to personality. The normal individual tends to be a social being. In dealing with atypicals it is well to realize that segregation accentuates the problem of adjustment. The atypical is trying to be one of an accepted group, and placing him in a restricted group may cause him to regard himself as inferior and not belonging to the accepted group. Being in a restricted group, therefore, adds to his adjustment problem. The "rejected" and "unwanted" individual may become a behavior problem. Social integration should result from sound education. The individual must be able to adjust to those outside forces which may affect him.

Mental-Emotional. This is often referred to as the Ego or integrative need. The individual needs to discover his role in life and develop a sense of worthy and effective selfhood. Today many fail to find themselves. They have only a meager understanding of the world in which they live, and not understanding, they are unable to formulate a policy for effective participation in their world. Three needs seem to stand out in this area:

1. One needs contact with reality. Attitudes are developed and behavior patterns are formulated by experiences. If experiences be only partial and restricted, behavior patterns are inadequate to meet the various aspects of life situations. One may not be able to understand the complex behavior of the world of today, but he may be guided to understand those activities which bring him into contact with Nature and thus give him a temporary relief from the strain and tension of modern living until he learns HOW to find himself. Youth needs a definite task or goal in life as well as guidance in formulating a plan to realize this goal. The atypical asks, "What significant place in life is there for me?" Every individual has a right in-so-far as his capacity will permit, to all those experiences which will enable him to make the greatest possible contribution to his own and to human progress. He needs to know how to use his assets, his strengths—not simply what he must NOT do.

The desire for pleasurable activity is not satisfied by the majority of activities which are necessary to earn a living today. Few can express themselves fully in their daily work. They exercise only a small part of their complex personality. The workers of today do only a small part in a routine which is monotonous for a high percentage of the participants. They fail to see and are rarely interested in the results of their labor. In addition to this there is a feeling of insecurity which develops an anxiety which may lead to somatic as well as psychic disturbances.

2. There should be a fair balance between success and failure. Too much success or too much failure may warp the personality.

3. The individual must find himself by useful conduct which contributes to the welfare of the group.

If these mental-emotional needs are not satisfied, frustration and mental conflict may cause increased emotional tension which cannot be expressed normally and which may be expressed in sublimated or perverted forms. The point to remember is that these frustrations pile up if they are not outwardly expressed.

EDUCATION

What does education do to satisfy the individual's needs? What does education hope to accomplish?

Education is concerned with preparation for complete living; a process of guiding or inculcating socially useful behavior. I believe the term "education for adjustment" has been used frequently enough to justify its use here. Assuming that education aims to train the individual so that he will be better able to adjust, we assume that this adjustment concerns the self and the environment. Prescott speaks of education as contributing to the satisfaction of the child's personality needs. Through experience the child learns how to bring about satisfaction of his own needs and contribute to the satisfaction of the needs of others. Education provides experiences favorable to the development of attitudes and value concepts that will support the maintenance of democratic institutions and processes of our society for the common good.

One task of education seems to be that of guiding the individual to discover his potentialities. Education, therefore, needs to provide the individual with experiences that will stimulate the progressive development of patterns of emotional behavior, which are recognized as mature in the light of the basic needs of the individual, and in the light of the social patterns in which these needs must function. By his educational experiences the individual should be better equipped to live with his fellowmen with tolerance and understanding, and accept his responsibilities in such a way that society is benefited.

What are the opportunities of the sports teachers for contributing to the accepted educational outcome? How can a program in sports education help to meet the needs of the atypical?

1. The early objectives of physical education were concerned with the organic health side or the physiological health of the individual.

2. The playground movement came about through the realization that juvenile delinquency might be prevented if youth were given opportunities to expend their surplus energy in socially approved big-muscle game activities. This movement recognized that youth was a period for action. Youth demanded a chance for success or failure through some medium that engaged all of his vitality. Games and sports are replete with opportunities for youth to find release along socially approved lines of his inner drives, urges, and emotions.

3. Following the World War the general acceptance of sports and games indicated that physical education

recognized the individual as a total personality with definite organic, social, and mental-emotional needs.

CONTRIBUTION OF PHYSICAL EDUCATION TO THE NEEDS OF THE ATYPICAL

It must be recognized that many conditions found among the atypical cannot be corrected, such as organic heart conditions, structural deviation of spine and feet, etc. It becomes necessary then to take the individual as he is and help him to secure the most from life.

1. *Organic.* It is obvious that many individuals today are in need of improvement on the physiological level. Without attempting to supply scientific data to support the statement, it is generally agreed that the use of one's large muscles (within one's capacity) may give some mental "lift" and general biological improvement. The satisfaction of the activity drive may lead to the more abundant satisfaction of other important drives and emotions.

2. *Social.* Everyone needs affection, security, prestige, the feeling of being like the other fellow, the feeling that he belongs. Studies of cases of individuals in institutions for the mentally ill reveal a background lacking in social contacts and devoid of recreative experiences. We learn from the psychologists that participation in desirable recreation is essential to balanced living. The atypical is often denied participation in many of the more popular sports. Sports and games have socializing values and at the same time provide abundant satisfaction in the release of many emotions, urges, and desires. Through sports the atypical individual learns to take his place with other members of the group. He learns to mingle with others. The many experiences which result from the functioning of the organism in the form of adaptive responses make him better able to make new adaptive changes which will assist him in adjusting himself to the conditions which our changing society may bring forth.

Care must be exercised at this point first to train the atypical in individual and dual activities in order that he may develop the essential knowledges, conditions, skills, and attitudes which will enable him to take his place in the group and engage in group activities and the more highly specialized team games, in such a manner that he specifically contributes to the success of the group. Too often we penalize the individual by placing him in group activities before he is ready to shed his egocentric skin.

Teach the atypical to play fairly and squarely, with initiative, with joy, with good sportsmanship in success and failure, and we have contributed to the state of his nature that will make him better able, in the game of life, to rejoice in its successes, to be a good sport in its failures, to hold his head high and strive again for that which he seems to have lost. Education must teach social integrity. This is possible when we recognize sports and recreation, not as waste of time and idleness, but as a continuation of education and an integral part of training for complete living.

3. *Mental-Emotional.* One needs contact with reality. Watching the average group of children at play makes one aware of the seriousness of the activity. Without

proper provision for recreation the atypical misses this opportunity of learning to face reality. He is thwarted. Properly directed play and recreation allows the individual to deal with real situations. Careful guidance is needed in this area. Many children attend expensive summer camps without ever learning much if anything about Nature. Through one's play experiences he learns to face reality, release anxiety, free aggressions, and formulate behavior patterns appropriate to meet new life situations. Play should be meaningful activity. If one is to understand our present scheme of living with its strain and tension, one must first gain experience by exercising racially old specific behavior patterns. Our present civilization fails to provide ample opportunity for the expression of racially old behavior patterns. Many of our common sports and games, however, are based on these old patterns. Thus through play the atypical is allowed to face reality.

One needs social experiences. Every one seeks success, attention, approval, recognition, and satisfaction. Properly organized play provides opportunities for a balance between success and failure. The normal individual needs these experiences. How much more does the atypical need them! Although subscribing to competition as a motivator of participation, one should recognize the satisfactions which are derived from the interest which is inherent in the activity. As our work-a-day living is filled with conflicts, so our recreation life should be relatively free from conflicts. The atypical should be guided in controlling his conduct for the benefit of himself and for the good of the group as a whole. This does not mean that he play without the hope of winning, but rather that he play primarily for the sheer fun and enjoyment of playing and as for those satisfactions which come from performing well the various skills of the game itself. Through recreative activities which are within one's capacity, he has opportunities to find himself through the development of definite skills and traits which are unique to him and which allow him to make definite contribution to the success of the group of which he is a part, and to which he belongs. Through recreative activities he learns the rules which govern all the group. He also learns that these rules are for his benefit as well as for the benefit of the group.

Knowing that his useful conduct contributes to the success of a worthy cause the atypical develops confidence in himself. At the same time his activity drive is being satisfied. As this drive stimulates the expression of many other drives, recreation may be considered as a prophylaxis against those emotional disturbances which may have their seat in the suppression of one's deeper drives and emotions. As the well-adjusted individual is one whose drives, urges, and emotions are most abundantly satisfied, physical education through games makes its contribution to the education of the atypical by assisting in this adjustment process.

If physical education is to provide opportunities for mental-emotional health guidance for the atypical, we must consider recreation as an integral part of education. Play should be viewed as the child's struggle toward ma-

turity in which he is guided in transforming himself from the egocentric animal into a socialized being. Play should be zestful action resulting in friendly intercourse with, rather than against, others and invested with the highest hygienic usefulness, not only from the physiological but from the social and mental-emotional point of view as well. Here is our hope for that balanced life which comes through the adequate and conventionally accepted release of our emotions; here is our hope for a satisfactory adjustment in an ever-changing social order.

CONCLUSION

In conclusion, the opportunities for mental-emotional

health guidance for the atypical cases may be expressed along three lines:

1. The organic or physiological where one's tissue needs and bio-chemical mechanism are satisfied.

2. Social where the individual learns to mingle with others and where his background becomes rich in desirable social contacts which contribute to his fund of experiences necessary for balanced living.

3. Finally, the mental-emotional opportunities where one learns to face reality, where he learns to experience success and failure, eventually finding his place in the group, not as an inferior personality, but one who can and does contribute to the success of the group to which he belongs.

A Case of Peripheral Neuritis Following Disulfanilamide Treatment

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THERE are now reports, mostly from Germany, of a number of cases of peripheral neuritis following the use of sulfanilyl sulfanilamide and dimethyl disulfanilamide. There is some confusion in terminology in regard to these drugs, both being referred to in some places as disulfanilamide. However, disulfanilamide or disulon refer only to sulfanilyl sulfanilamide. Dimethyl disulfanilamide is known also as uliron, disepitol, and D 373.

Wigton and Johnson¹ reported four cases, three of whom received disulfanilamide, 30 to 104 grams, the other dimethyl disulfanilamide, 28 grams. All four developed a similar clinical picture of pain and weakness in the lower legs and feet and weakness in the hands, especially the adductors of the thumbs. One showed partial reaction of degeneration of the adductor pollicis, another an abnormal response to electrical stimulation of the thenar muscles. Slight sensory involvement was found in some. These writers refer to a number of cases reported in Germany with remarkably similar complaints and findings, all following the use of dimethyl disulfanilamide (uliron). It has been suggested, of course, that since most of these patients were being treated for gonorrhea, the neuritis was on the basis of the infection. However, enough of the cases reported were being treated for another infection to make this an inadequate explanation. Rosenthal² of the United States Public Health Service found that sulfanilyl sulfanilamide administered to rabbits and chickens produced cumulative and delayed toxic effects, but to a less degree than sulfanilamide itself. Nelson³ studied the histopatho-

logical changes in these animals. No central nervous system lesions were found, but peripheral neuritic changes as shown by rarification of small numbers of segments of nerve fibers and fragmentation of myelin were fairly frequent in sulfanilyl sulfanilamide, much less so in disulfanilamide.

Improvement in most of the cases reported has been incomplete. One of the patients discussed by Wigton and Johnson received 30 to 50 milligrams of thiamine chloride daily for 17 days with only partial recovery. A case reported from Amsterdam by Van Valkenburg and Kreuzwendedich von dem Borne⁴ developed weakness of the extremities, dysesthesias, paresthesias, and slight atrophy of the interossei after taking 16 grams of dimethyl disulfanilamide for colon bacillus infection. Their patient recovered after taking vitamin B₁ (amount not stated). They suggest without any explanation that a pre-existing deficiency is probably necessary for the development of the neuritis. In the studies of Rosenthal mentioned above the drugs were tolerated better by rabbits fed cabbage alone than by animals fed cabbage and oats, or only oats. No conclusions are drawn as to what this may mean from the standpoint of vitamin deficiency.

The patient to be reported here is a 24 year old graduate student from Turkey. In November, 1938, he started taking disulon brand of disulfanilamide. For one week he took 60 grains daily, followed by two weeks with no treatment. The next two weeks he took 30 grains daily, followed again by two weeks without treatment. The third course, 30 grains daily, was started and then stopped after a few days because of the appearance of

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symptoms. The exact amount of disulfanilamide he took is not certain, but it was probably in the neighborhood of 1000 grains (66 grams) in two months.

The symptoms appeared in January, 1939, and consisted of weakness in the legs and pain after moderate exertion, and weakness of the hands, which progressed to such a stage that he had great trouble picking up objects off a flat surface, buttoning his clothes, or holding a pen, and he could not shave himself. He was examined at that time, but nothing abnormal was reported either physically or on laboratory investigation. The blood sulfanilamide was negative.

The patient was first seen by the neurologic service early in May, about three and one-half months after the onset. He said there had been some improvement in the use of his hands, but he still complained of weakness of the legs with easy fatigue and pain, and difficulty in using his hands. Examination then showed hands of the so-called simian type. Although he was rather obese, the atrophy of the thenar muscles and the interossei was very apparent. Adduction of thumbs and fingers was very weak, and there was almost total lack of opposing power of the thumbs. Flexion of thumbs and fingers was limited to the interphalangeal joints. Muscles of the arms, forearms, thighs, legs and feet were entirely normal functionally, and no atrophy could be detected. Cremasteric reflexes were absent, but all others were present but hypoactive. Cranial nerves were intact, as was sensation in all modalities, and all the other components of the neurological examination were negative. Electrical stimulation revealed partial reaction of degeneration of the hand muscles.

Skull films were normal as was the spinal fluid, blood serology, blood chemistry, and urinalysis. Gastric aspiration showed free acid of 30 degrees and total acid of 40 degrees.

He was given 100 milligrams of vitamin B₁ intramuscularly, and then was started on brewer's yeast 12

grains three times daily and thyroid one-half grain daily, and he took a series of seven treatments using heat and massage. By the middle of June no perceptible improvement had occurred. Thyroid was stopped after one month, but he continued taking yeast tablets throughout the summer.

He was not seen again until October 4. All motions of the hands were then normal and strength was good. Otherwise examination was as before. Electrical stimulation showed no reaction of degeneration.

Because of the suggestion that an underlying deficiency accounted for the appearance of this syndrome following disulfanilamide, his dietary of last year was investigated. He does not like the way things are cooked in American restaurants, and therefore does his own cooking. But, aside from the fact that he will not drink milk, his diet seems complete and not limited in any way.

It seems fairly certain that the two drugs disulfanilamide and dimethyl disulfanilamide result in some individuals in the development of a rather consistent type of peripheral neuritis. The similarity of the clinical picture in this patient to that reported in other cases makes the conclusion inescapable that this is an example of the same sort of thing. No conclusions can be drawn as to therapy, although recovery seems complete in a period of nine months.

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Endometriosis*

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ENDOMETRIOSIS, which is characterized by the presence and growth of tissue containing elements indistinguishable from those found in the endometrium outside the normal habitus of the latter, has, in recent years, become an increasingly important problem for the abdominal surgeon and gynecologist.

Although Babes apparently first described the condition in 1882, it was not until Sampson's excellent and startling observations were made known in 1921 and 1922 that the medical profession began to look for and find this interesting process in an increasingly high percentage of laparotomies for pelvic disorders.

Endometriosis has been estimated in recent years by various authors to be present in from 10 to 35 per cent of patients subjected to abdominal operation for gynecologic disorders. Certainly the surgeons of thirty years ago would have observed such an unusual condition if it had appeared so frequently. The medical profession, therefore, is more or less forced to assume that what is now a common disorder was thirty or forty years ago apparently rare.

POSSIBLE CAUSATIVE FACTORS

Many hypotheses have been advanced concerning the probable cause of endometriosis. These consist of three general hypotheses: (1) the embryonic, (2) the metaplastic and (3) the migratory.

The first or embryonic theory was championed by Von Recklinghausen and Cullen who thought that endometrial implants arose from remnants of the wolffian and müllerian ducts, respectively. This hypothesis could explain the origin of endometriomas only in the region in which these vestigial structures are known to be present and largely for this reason is not as favored at present as the theories which follow.

The hypothesis of a serosa-epithelial metaplasia of the peritoneum was first suggested by Iwanoff. Meyer, Lauche, Witherspoon and Meigs in turn have given it support. It is believed that under the influence of an ovarian hormone or possibly some type of inflammation the endothelial lining of the peritoneum assumes the characteristics of the cells of the endometrium. Meigs has found recently that in his own private practice the incidence of endometriosis was 32.2 per cent of all gynecologic cases in which laparotomy was performed and he expressed the belief that it was much more common in the class of patients seen privately than among those seen in the general hospital or charity service. With this belief Mallory apparently agrees. Meigs also has observed that two types of patients have endometriosis: (1) those who are normal in every way except that because of economic conditions or custom in recent years, marriage and especially pregnancy have been de-

layed, and (2) those who have signs of pelvic underdevelopment (congenital erosion of the cervix, fibroids, dysmenorrhea, sterility, and so forth) and who, because they are underdeveloped sexually, do not marry. He summarized thus: "Menstruation, through the hormones estrin and progesterin, causes a growth and functional change in the endometrium. This change, a preparation for pregnancy, should in a normal female be utilized. . . . In the modern woman, late marriage, contraception, and the like, allow a prolonged menstrual life without interruption. It is generally conceded that the peritoneal covering of the ovaries and uterus and the pelvic peritoneum are derived from the celomic epithelium. The müllerian ducts arise from the celomic epithelium and form the tubes, uterus, and cervix. In the course of such formation cells of müllerian epithelium and areas of primitive celomic epithelium may not be utilized. Under too prolonged and uninterrupted stimulation of the hormones, estrin and progesterin, unutilized cells of the celom may become müllerian or uterine and thus produce endometriosis, while under even shorter stimulation the epithelium of the patient with stigma of underdevelopment may develop into endometriosis."

The metaplastic theory, although very ingenious, does not explain the presence of endometriosis outside the celomic cavity, for example in the inguinal glands, the arm and thigh and possibly the lung.

The third or migratory hypothesis assumes that the endometrial-like tissue of endometriosis has its origin in the uterine mucosa and reaches its ectopic position by (1) invasion, (2) implantation and (3) metastasis.

Cullen first advanced the invasive theory and there is no question that adenomyomas of the uterine wall probably originate in this fashion and may, by contiguous extension, even involve the cul-de-sac of Douglas and intestine. However, it does not adequately explain the pathogenesis of endometriosis in other regions.

The implantation theory of Sampson is the most popular explanation. He expressed the belief that a retrograde flow of menstrual blood during menstruation results in the grafting of endometrial cells on contiguous and neighboring pelvic organs. Likewise, this hypothesis does not explain distant endometriosis. Masson brought further evidence against this theory by pointing out that if there is a reflux of menstrual blood through the tubes, the chemical irritation of the blood should close them by dense adhesions. This occurs in complete obstruction of the uterine cervix with resultant hematometria and hematosalpinx. In this type of disorder there is no evidence at operation of an accumulation of blood in the pelvis.

The hypothesis of extension by lymphatic and venous metastasis has gained much impetus in recent years and seems to me to offer the best explanation for the pathogenesis of endometriosis in all situations. Halban in 1924

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was the first to contribute this explanation of all forms of endometriosis. It is believed that during menstruation, possibly owing to uterine contractions in the presence of open lymphatic vessels, that endometrial tissue is carried by way of the known normal lymphatic drainage of the uterus to the usual site of endometriosis. By this hypothesis, it is possible to explain the presence of endometriosis in any situation in which it has been reported and even in the lung where Schwarz has found it clinically, but has not yet been able to verify it pathologically. Endometrial tissue has been demonstrated in the lymphatics by Gricouroff and Henry and recently Hobbs and Bortnick have been able to produce such lesions of endometriosis in the lungs of rabbits by injecting intravenously the normal endometrium of these animals.

GENERAL CONSIDERATIONS

There has been considerable confusion in regard to the various terms used in describing endometriosis in its many forms and situations. In general it has been customary to use the term "adenomyoma" for any discrete tumor-like lesion of endometriosis, wherever found. Probably it is better to reserve the term "adenomyoma" for lesions confined to the uterus, round ligament and tube and to call all other implants in the cul-de-sac, ovary or elsewhere, endometriomas. Although, from a pathologic and histologic standpoint, adenomyosis is a more descriptive term than endometriosis, the latter has such a foothold with the medical profession that the former more accurate term for the condition will probably never displace it.

At operation, endometriosis in its early stages presents usually several bluish-black blebs containing a drop of tarry fluid surrounded by a puckered peritoneal surface which tends to be drawn forcibly to the individual lesion. These regions usually are found in the cul-de-sac just back of the cervix, frequently extend into and involve the uterosacral ligaments and may be found anterior to the reflection of uterus at the bladder. The ovaries are frequently the seat of similar endometriomas which, by growth and hemorrhage, may produce chocolate or tarry cysts that almost completely destroy the ovaries and range in size from a few millimeters in diameter to cysts filling and obliterating the entire cavity of the pelvis. These cysts are markedly adherent and produce dense adhesions. It is almost impossible to dislodge them from the pelvis without rupture and soiling from their thick, chocolate, tarry contents. This cyst must not be confused with the hemorrhagic corpus luteum cyst of the ovary, which is not a part of the picture of endometriosis. Adenomyomas of the uterus, round ligaments and tubes or endometriomas of the rectum, bladder, umbilicus and bladder may or may not be associated with the foregoing picture or may appear alone without other evidence of endometriosis. The adenomyomas grossly somewhat resemble fibroids, but they are not as white, round or as discrete in the uterine wall as the latter.

In an analysis of 884 cases of endometriosis encountered at The Mayo Clinic in which the diagnosis was

verified by pathologic examination, Masson and Counsellor found involvement of the following organs: uterus (including cervix), ovary, rectovaginal septum, ligaments of the uterus, sigmoid, rectosigmoid, rectum, pelvic peritoneum, vagina, fallopian tube, umbilicus, ileum, appendix, bladder and abdominal wall. In addition, endometriosis has been reported in the inguinal lymph nodes, labia, thigh, arm and possibly the lungs.

No matter what the location, the histologic picture is always similar. Glandular epithelium is indistinguishable from normal endometrium. About these ectopic islands of columnar cells, which are frequently ciliated, there is a connective tissue stroma similar to the uterine submucosal layer and in which are smooth muscle fibrils. In other words, all the essential components of the whole uterus are present. Even more striking is the observation of Dockerty that this ectopic endometrium follows the same cycle as that in the uterus. In addition, during pregnancy, the formation of decidua has been observed.

Malignant lesions may be associated with endometriosis. Such associated lesions were observed in 2 per cent of 884 cases of endometriosis reported from the clinic by Masson and Counsellor. These accompanied adenomyomas of the uterus in 3 per cent of cases, but, nevertheless, were thought to be entirely independent.

The ages of the patients in the series from The Mayo Clinic ranged from 21 to 73 years with a mean age of 41.9 years. Eighty per cent of the patients were in the fourth and fifth decades.

DIAGNOSIS

The symptoms of endometriosis vary with the location and extent of the lesions but on the other hand even an extensive process may not give rise to symptoms. The lack of diagnostic or salient symptoms is borne out by Counsellor's survey, which revealed that in only about 20 per cent of cases was a correct preoperative diagnosis made. He explained this by the fact that more than half of the patients had associated pelvic disease, such as fibroids, cystic ovaries or carcinoma, which obscured the endometriosis.

Often there is a history of relative or absolute sterility. In The Mayo Clinic series 162 patients were studied in regard to fertility and of these 131 were married and pregnancy could be expected normally. In this group there was a high incidence of miscarriages (16.8 per cent) and absolute sterility occurred in 32.1 per cent. More than half (56.5 per cent) of the patients had one or more pregnancies, but only 39.7 per cent of the married women with endometriosis were delivered of living babies.

Dysmenorrhea of the acquired type is often an outstanding symptom and usually is progressive in intensity. It may appear several days before the onset of the menstrual flow and as the latter appears tends to diminish in severity. Frequently, it does not have this characteristic and cannot be distinguished by its onset from other varieties of menstrual pain. Counsellor found that 46.8 per cent of patients had dysmenorrhea and that 24 per cent had no pain at all. Frequently he observed that

the pain was made worse by exertion, defecation and urination.

Pelvic discomfort progressing to actual pain which may be of the "dragging" or "bearing down" variety and present between periods, only to undergo exacerbation with the period, is often found and of course is usually the result of endometriomas in the broad or uterosacral ligaments or large adenomyomas in the uterus.

More than 65 per cent of patients in The Mayo Clinic series gave a history of menorrhagia and metrorrhagia. Only 15.6 per cent were found to have no abnormality of menstrual flow. Frequently the patients with menorrhagia will be found to have chocolate cysts of the ovaries and associated cystic endometrium which would indicate enough destruction of ovarian substance to produce ovarian failure. A brownish premenstrual and postmenstrual discharge is a common symptom. Dyspnea is another outstanding complaint.

Patients suffering from endometriosis frequently have submitted to previous operations and often the real trouble has been overlooked and a cystic ovary or appendix removed without, of course, amelioration of symptoms. Counseller found that 54.2 per cent of the patients in his series had previous operations of which 56.9 per cent were on the uterus, tubes or ovaries and 30 per cent on the appendix or elsewhere in the abdomen.

Pelvic examination may give entirely negative results or in other instances, the endometriosis will be masked by uterine leiomyomas or ovarian cysts. Frequently on bimanual (rectovaginal) examination, pelvic manipulation may be unusually painful and thickening or actual endometriomas may be detected in the uterosacral ligaments and cul-de-sac. The uterus may be pulled into an adherent retroversion and be nodular because of adenomyomas. If chocolate cysts of the ovaries are present, the enlarged adnexa usually are palpable, but the chocolate cysts differ from ordinary ovarian cysts because they are fixed in the pelvis and are indefinite in outline. On examination of the vagina and cervix with the speculum, endometriomas, similar to those described in the cul-de-sac, may be discernible. A brown, mucoid discharge may be seen issuing from the cervical canal.

The diagnosis is based on the aforementioned pelvic findings; the patient usually gives a history of absolute or relative sterility, acquired dysmenorrhea or pelvic pain, menorrhagia or metrorrhagia or both and is between the ages of 30 and 50 years.

TREATMENT

The treatment of endometriosis might be a much more difficult problem if it were not for the well proved fact that individual lesions tend to subside or may completely disappear following castration surgically or by means of radium and roentgen rays. In general, there are two types of surgical treatment, radical or conservative, and the type best suited for the individual can be chosen only by a careful evaluation of the patient's age, her desire and the actual possibility of pregnancy, and the extent of the lesion as determined at the time of laparotomy.

In 80 per cent of the patients operated on at The Mayo Clinic, it was found advisable to perform panhysterectomy. It is our feeling that for women more than 37 to 38 years of age, the chance of pregnancy following a conservative procedure is so small, even though the endometriosis may not be advanced or diffuse, that they are better off with a radical procedure. We prefer the total operation, but occasionally there may be such extension locally in the parametrial tissue as to make this procedure hazardous. Under these circumstances, if the cervix is normal, a subtotal hysterectomy is elected.

If the patient is less than 37 years of age and it is believed a conservative procedure may be advisable, laparotomy should be preceded by curettage to determine the status of the endometrium. If there is no menorrhagia or evidence of cystic endometrium, which might indicate early ovarian failure and the process is limited in extent so that the surgeon may conscientiously preserve one tube and ovary with a reasonable possibility of pregnancy, if this is desired by the patient, certainly an attempt for conservatism is justified. If cystic endometrium is found on curettage or if the patient already has menorrhagia, a conservative procedure is not justifiable and hysterectomy should be performed, even though it is possible to save or transplant normal ovarian tissue. The reason for this is that menorrhagia accompanying endometriosis is frequently progressive and if further ovarian resection is indicated at operation and carried out even more severe bleeding will occur post-operatively. Likewise, if bilateral salpingectomy is necessary, saving the uterus is not justifiable for these younger women, who are so frequently subject to menorrhagia and dysmenorrhea. In other words, if there is no possibility of later pregnancy, there is no rationale for preserving the uterus in this type of case.

If it is found possible to conserve one or both tubes and ovaries, all the endometrial implants should be excised or destroyed by fulguration. If the uterus is preserved, resection of the presacral nerves should be added to the operation in the hope of relieving any present or subsequent dysmenorrhea. This procedure apparently will relieve only the visceral pain and, of course, would have no effect on the endometrial implants elsewhere in the pelvis from which pain is transferred by means of the somatic nerves. Thus far, the statistics from The Mayo Clinic have failed to reveal any striking difference between the results in cases in which presacral neurectomy was performed and those in which it was not. The number of cases in which this additional procedure is employed is small and it is felt, at present, that fundamentally it should give the patients undergoing conservative surgical procedures an added chance of permanent relief. If hysterectomy is performed, of course, there is no need for presacral neurectomy. Certainly, the patient desiring conservative surgical procedures should be made aware of the progressiveness of the disease and the possibility of recurrence necessitating further operation or irradiation. Frequently, when this is known to her, she will not be so insistent on conservatism.

Counsellor found that of fifty-five patients who submitted to conservative operation and for whom preg-

nancy was theoretically possible, seven (12.6 per cent) became pregnant, one or more times. These seven patients had ten children and one miscarriage.

When the colon is involved in endometriosis, an extensive process which requires panhysterectomy is usually present. If this is done, the lesion in the colon will subside. If intestinal obstruction is present, a temporary colonic stoma is indicated, followed by the pelvic operation which usually includes castration. After the lesion in the colon regresses, the temporary stoma may be closed. If there is little evidence of endometriosis, except in the sigmoid and the patient is more than 38 years of age, castration may be effected by means of roentgen rays or radium. For younger women who have essentially normal pelvic viscera, resection of the bowel may be the operation of choice in order to remove the involved segment. Mayo and Miller found in 31 cases of endometriosis of the sigmoid and rectum that in only seven was the intestine resected. When the bladder is involved, the same principles are adhered to as outlined for involvement of the colon.

Radium and roentgen rays are reserved for those patients (1) who are exceedingly poor operative risks, (2) whose symptoms are dysmenorrhea or menorrhagia or both with little demonstrable pathologic change on examination and who are more than 40 years of age, and (3) who have certain recurrences following conservative operations.

CONCLUSIONS

The incidence of endometriosis is apparently increasing and this may be related to the recent tendency to delay marriage and pregnancy because of economic factors arising in the last few years.

Recent evidence supports the lymphogenous theory of spread of the endometrium resulting in endometriomas.

A patient between 30 and 50 years of age with a tender pelvis and palpable nodules on rectovaginal examination who has a history of relative or absolute sterility, acquired dysmenorrhea or pelvic pain, menorrhagia or metrorrhagia, or both, probably is suffering from endometriosis.

The treatment of choice is panhysterectomy, but conservative surgical procedures are indicated for young patients without extensive disease when only one tube and ovary are involved and there is a reasonable chance of ensuing pregnancy, provided evidence of ovarian fail-

ure as indicated by menorrhagia or cystic endometrium is not present.

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The Relation of Self-Support to Male Student Health at the University of Michigan

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PROGRESSIVE educators are constantly asking the question: Is there a definite relationship between the elements of self-support and student health other than that relationship which exists between non-self-support and student health? This study attempts, so far as the sources of information employed permit, to answer the foregoing question.

Although much has been written about student self-support in general, comparatively few studies have been made as regards its actual relationship to health. In 1932, Mnstatd¹ reported in a survey of student self-support at the University of Minnesota that self-supporting students had a larger number of entries to the hospital than non-self-supporting students. In a general study made at the University of Michigan, North²—concluding that her study of female groups was not extensive enough to reach definite conclusions—stated that “there is no outstanding difference between the health and scholastic ratings of the self-supporting group as compared with those of the non-self-supporting group;” also, the self-supporting group had more infirmary entries and days than the non-workers. Bradshaw,³ college physician of Oberlin College, Ohio, found that self-supporting students had a larger number, per thousand students, of clinic visits, upper respiratory tract infections, and hospital days.

Two seemingly representative groups of fifty members each, workers and non-workers who had spent at least four years at the University of Michigan, were selected from the records of the Statistical Bureau of the University of Michigan for the purposes of the present study. One group, the control, was classified as totally non-self-supporting; the other group was classified as being wholly self-supporting; a series of subsequent, objective check-ups verified these classifications. It was originally intended to employ sample groups of 100 each, but shortages in individuals' records, etc., necessitated the cut-down. A number of uncontrollable, extraneous factors, with respect to both groups, served—in all likelihood—to lessen this study's accuracy. It is probable that the results and conclusions would have been still more significant if it had been possible—from the commencement—to control the sources of error, and maintain sample groups of 100. All items of data pertaining to the health of students in both groups were gathered from the records of the University of Michigan Health Service.

Students come to the dispensary for the diagnosis and treatment of such minor ailments as respiratory infections, bruises, general infections, eye-refractions and examination. They also seek consultations with a psychiatrist, or merely request general physical examinations. Calls are made to students' rooms at home by

University staff physicians when students are unable to come to the Health Service. The usual causes for room calls are gastro-intestinal upsets, severe headaches, various types of fevers, etc. On recommendation by Health Service physicians, students are admitted into the infirmary for rest, diagnosis, minor operations (tonsils and adenoids, infections, etc.), treatment of acute upper respiratory infections, observations; and—in general—for conditions which are severe, require treatment, rest, and bed-care, but are not severe enough to require hospitalization. The prime causes which necessitate hospitalization are major operations and contagious diseases.

One might, for obvious reasons, conclude that the general health of one group is better than the health of the other if an analysis of the data should disclose a definite, significant difference between the two groups in the number of dispensary visits, infirmary and hospital admissions and days, etc. Since dispensary visits are, usually, for very minor ailments, and since the number of hospitalizations considered for both groups was too small for accuracy, *the best criteria at hand which makes it possible to almost definitely establish the relationship between self-support and health are the number of infirmary admissions, and days during which the students were confined as patients in the infirmary.* Insofar as admissions and days of confinement for contagious diseases are concerned, the ties between the elements of self-support and hospitalization are not very strong.

Dispensary visits. A total of 3,145 dispensary calls, including acute upper respiratory infections, were made by both groups during a four year time period. Of this number, 1,707 or 54 per cent were for workers, and 1,438 were for non-workers. The average number of calls for workers was 34.14, as compared to 28.76 for non-workers. The range in the number of individual calls varied from 2 to 128; the distribution of individual calls between these two extremes showed no marked difference for the two groups. The difference between the average number of calls for workers and non-workers was 5.38 ± 3.31 . This difference is about 1.6 times its measure of reliability, indicating that there are about 72 chances out of 100 that this difference would again appear in another sample similar to the one employed in this study.

Acute upper respiratory infections. Workers had a total of 198 acute upper respiratory infections over the four year period, as compared to 139 for the non-workers. The self-supporting group had an average of 3.96 infections per individual, as compared to an average of 2.78 for the non-self-supporting group. A total of 86 per cent of the self-supporting students had one or more acute upper respiratory infections during the four

year period, as compared to 78 per cent of the non-self-supporting group. The difference between the two groups is 0.08 ± 0.06 . This difference is, slightly, more than one time its reliability measure, indicating that out of this sampling there is a possibility that it is a little better than chance that the difference which exists in the incidence of acute upper respiratory infections for workers and non-workers is significant.

Eye-glasses and refractions. Of the self-supporting students, 19 wore glasses when they first entered the University; while the same was true for 16 non-self-supporting students. Of a total of 65 who did not wear glasses on entrance, 31 were workers and 34 were non-workers. After entrance into the University, 26 per cent of the workers and 15 per cent of the non-self-supporting students received glasses. The difference of 11 per cent between the two groups is nearly twice its Probable Error (0.06), and can be interpreted as indicating a probability that there is a tendency for more working than non-working students to receive glasses.

No eye refractions were made for 23 self-supporting, as compared to 32 non-self-supporting students (out of a total number of 55) for the four year period. Out of a total of 54 refractions for both groups (see Table A), 34, or an average of 0.68, were made for workers during the four year period. A total of 20, or an

TABLE A

Total and Average Number of Eye Refractions, Infirmiry Admissions and Days, Hospital Admissions and Days for Fifty Male Self-Supporting and Fifty Male Non-Self-Supporting Students Over a Four Year Period: University of Michigan Health Service Records, May, 1938.

	Number					
	Total			Average		
	Total	S.S.	N.S.S.	Total	S.S.	N.S.S.
Eye Refractions	54	34	20	0.54	0.68	0.40
Inf. Admissions	64	40	24	0.64	0.80	0.48
Infirmiry Days	334	222	112	3.34	4.44	2.24
Hosp. Admissions	21	14	7	0.21	0.28	0.14
Hospital Days	184	112	72	1.84	2.24	1.44

average of 0.40 were made for the non-workers. The difference between the two groups is 0.28 ± 0.086 . This difference is more than three times its reliability measure, indicating that there are about 95 chances out of 100 that the difference is significant. In other words—disregarding the reasons—there is a very good possibility that more eye-refractions are made for self-supporting than for non-self-supporting students.

Room calls. Of the total of 51 calls made by University physicians to the rooms of students in both groups, 26 calls were made for workers, and 25 for non-workers. The workers had an average of 0.52 room calls, as compared to 0.50 for the non-workers; 68 per cent of both groups had no calls. The conclusion may be drawn, for obvious reasons, that there is no significant dissimilarity in the number of room calls received by members of both groups.

Infirmiry admissions. A comparison of infirmiry admissions for the two groups reveals, in table B, that 52 per cent of the self-supporting group had no infirmiry admissions, as compared to 70 per cent of the non-self-supporting group. A total of 48 per cent of the workers had one or more admissions into the infirmiry, as compared to 30 per cent of the non-workers. Out of the

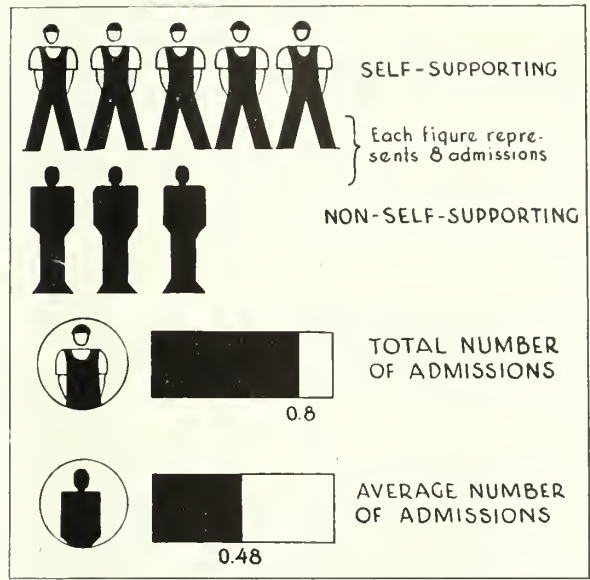


Fig. 1. Infirmiry admissions of fifty male self-supporting and fifty male non-self-supporting students over a four year period: University of Michigan Health Service Records, May, 1938.

total 64 infirmiry admissions (see table A), 40 were for self-supporting students; while only 24 were for non-self-supporting students. The average number of admissions is 0.80 for workers, and 0.48 for non-workers. These admissions are clearly illustrated in figure 1. Of the students having no admissions to the infirmiry, 26 were self-supporting, and 35 were non-self-supporting. It is also interesting to note, in the consideration of both groups, that some people were admitted so many as three times; and one individual had as many as four admissions.

Although it is not absolutely certain, there is a very good possibility that the health of the self-supporting students—as judged by infirmiry admissions—is poorer than the health of the non-self-supporting students since the difference between the 48 per cent of workers and the 30 per cent of non-workers admitted is 0.18 ± 0.06 . This difference is three times its reliability measure, indicating that there are about 95 chances out of 100 that the difference is significant, that the element of chance—in this instance—plays a very minor and insignificant role.

Infirmiry days. A total of 26 workers and 35 non-workers spent no days in the infirmiry; 9 workers had 10 or more days in the infirmiry, as compared to 4 non-workers; 16 workers had from 4 to 9 infirmiry days, as compared to 8 non-workers. The largest number of infirmiry admissions were for more than one day. The self-supporting students spent a total of 222 days, or an average of 4.44 days, in the infirmiry; non-self-supporting students spent a total of 112 days, or an average of 2.24 days each, in the infirmiry (see table A and figure 2). The difference between the average number of days for workers and non-workers is 2.20 ± 0.87 which—like the case of infirmiry admissions—is better than two and one-half times its reliability measure, indicating,

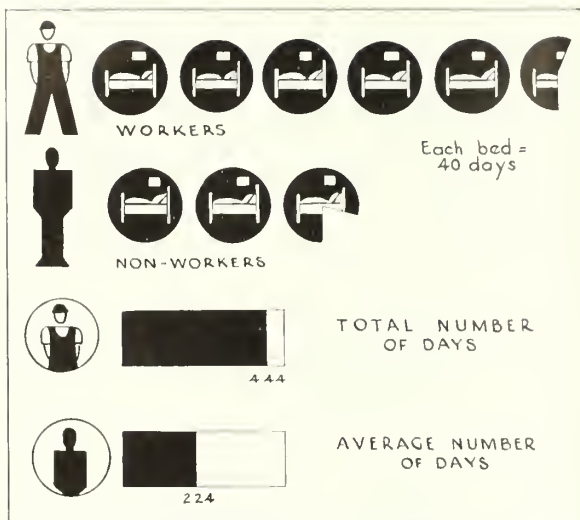


Fig. 2. Infirmary days of fifty male self-supporting and fifty male non-self-supporting students over a four year period: University of Michigan Health Service Records, May, 1938.

also, that there are about 95 chances out of 100 that the difference is not due to chance. The significance of the results obtained (in this study) is almost completely beyond question: the element of self-support increases the number of days spent in the infirmary.

TABLE B

Percentages of Infirmary and Hospital Admissions for Fifty Male Self-Supporting and Fifty Male Non-Self-Supporting Students Over a Four Year Period: University of Michigan Health Service Records, May, 1938.

		No Adm's. Pct.	1 or More Adm's. %	Total %
INFIRMARY	S.S.	52	48	100
	N.S.S.	70	30	100
HOSPITAL	S.S.	80	20	100
	N.S.S.	88	12	100

Hospital admissions. The 50 workers had 14 hospital admissions, or an average of 0.28 admissions per person; as compared to 7 admissions, or an average of 0.14 for the 50 non-workers. Of 84 students who had no admissions, 40 were self-supporting, while 44 were non-self-supporting. The difference between the 20 per cent of workers and 12 per cent of non-workers who were hospitalized (see table B) is 8 per cent \pm 5 per cent. This difference is slightly more than one and one-half times its reliability measure, indicating that it is only a little better than chance that the difference is statistically significant.

Hospital days. Of the fifty students in each group, 40 self-supporting and 44 non-self-supporting students spent no days in the hospital. A total of 10 self-supporting students spent 112 days in the hospital, as compared to 6 non-self-supporting students who had a total of 72 hospital days. The average number of days for the workers was 2.24; the average for non-workers was 1.44. The difference between these averages is 0.80 ± 0.69 . This is slightly more than once its measure of reliability; therefore, the conclusion may be drawn that the difference which exists between the two groups is only slightly better than chance, and is not reliable.

CONCLUSIONS

As a result of the sampling employed in this study, the following conclusions may be reached:

1. There is a distinct relationship between self-support and male student health at the University of Michigan; and this relationship differs from that which links non-self-support and male student health.

2. The differences between workers and non-workers with respect to the number of dispensary visits, room calls, incidence of acute upper respiratory infections, and hospital admissions and days are, statistically, of slight or no significance.

3. It is probable that there is a tendency for more working than non-working students to receive glasses after entrance into the University. It is almost certain that more eye refractions are made for workers than non-workers by optometrists in the University of Michigan Health Service.

4. Workers have a statistically significant, higher number of infirmary admissions and days than non-workers. The difference between the 48 per cent of workers and the 30 per cent of non-workers admitted is 0.18 ± 0.06 ; the difference between the average number of days for workers and non-workers is 2.20 ± 0.87 . These differences are the best criteria for stating that the health of self-supporting students is poorer than the health of non-self-supporting students, and support North's¹ contention that workers have more infirmary entries and days than non-workers.

In general, the figures and data obtained and presented for all phases of the problem under consideration are heavier for self-supporting students throughout the study. The results and conclusions obtained from the infirmary admissions and days for both groups, together with additional supplementary evidence, answer the question originally posed; and largely confirm the findings of the few other investigators who have delved into this problem.

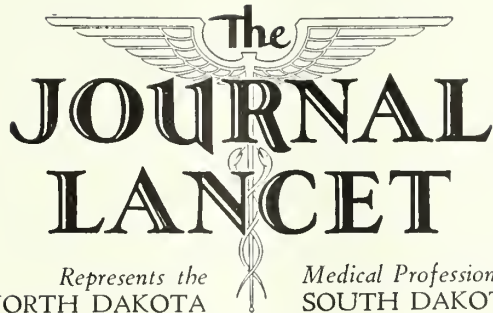
Broadly stated, the general health of self-supporting students is inferior to the health of non-self-supporting students; however, to further increase the accuracy of this final conclusion, a larger study of a greater sample of students in both groups should be made.

POSSIBLE NEW STUDIES

1. Relation of eye-glasses to racial stock of self-supporting and non-self-supporting students.
2. Incidence of venereal diseases among self-supporting and non-self-supporting students.
3. Relation of incidence of tuberculosis among working and non-working students to heredity.
4. The relationship of self-supporting and non-self-supporting students participating in sports activities to the general health of both groups over a four year period.
5. The relationship of racial stock to student health.

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North Dakota State Medical Ass'n
North Dakota Society of Obstetrics
and Gynecology

South Dakota State Medical Ass'n
Sioux Valley Medical Ass'n
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MINNEAPOLIS, MINN., JANUARY, 1941

This Year

Some of our readers we have met, others not, but we belong to the same fraternity, the greatest in the world. We think of you every time a line is penned for these pages, but with the dawn of a New Year, we would convey to all a special message.

We try each month to give you something of interest to read, something that may be helpful and something to think about. It may be new, different, or controversial in nature, but it is current medical literature, the dissemination of which we are pleased to transmit to those who are eager to follow the trend of progress in an ever changing world.

In wishing our readers a happy New Year, we would like to have them know that it is not a perfunctory expression but one that comes from deep down in the heart. It is the sincerity of a wish that counts, and we would like to have our friendly interest felt by all who read these pages. We wish it were possible to extend a handshake and look each reader in the eye as we wish him this happy New Year.

A. E. H.

News Items

Dr. E. A. Kilbride, Worthington, Minnesota, is the new president of the Sioux Valley Medical Association. He was elected as successor to Dr. John H. Henkin, Sioux City, at the association convention, December 4, in Sioux Falls, South Dakota. Other officers are: Dr. R. S. Westaby, Madison, South Dakota, vice-president; Dr. Roy E. Crowder, Sioux City, secretary; and Dr. F. P. Winkler, Sibley, Iowa, treasurer.

Dr. Henry Kermott, formerly of Spokane, Washington, has returned to Minot, North Dakota, to become associated with his father, Dr. L. H. Kermott. The younger Dr. Kermott is a graduate of Rush medical school; he completed a 4-year fellowship at the Mayo Foundation and recently was associated with Dr. H. E. Wheeler in Spokane.

Dr. Theodore Keller, formerly of Rolette, is now practicing in Rugby, North Dakota, with Dr. O. W. Johnson.

Dr. William Black was elected chief of staff of the Immanuel hospital, Mankato, Minnesota, at the annual dinner meeting held December 19, 1940.

Dr. D. S. MacKenzie, Sr., Havre, Montana, was re-elected president of the Hill County Medical society recently. Dr. L. T. Sussex was re-elected secretary and Dr. G. A. Jestrab named vice-president.

New officers of the Yankton District (No. 8) Medical society (South Dakota), are as follows: Dr. John Bushnell, president; Dr. R. F. Hubner, vice-president; Dr. J. A. Hohf, secretary and treasurer; Dr. John Bushnell and Dr. F. W. Haas, delegates; Dr. R. F. Hubner and Dr. E. M. Stansbury, alternates; Drs. E. M. Morehouse, E. M. Stansbury and Geo. E. Johnson, board of censors.

Dr. Drury Claybourne, Big Timber, Montana, is the new president of the Park-Sweet Grass Medical society.

Dr. R. H. Beiswanger, who practiced in Wykoff, Minnesota, the past 11 years, recently sold his practice to Dr. Richard Herbst. Dr. Beiswanger has a three-year fellowship in roentgenology at the University of Minnesota.

Dr. Allen R. Foss, Missoula, Montana, has been appointed to the Montana State Board of Medical Examiners to succeed the late Dr. George M. Jennings of Missoula.

Dr. R. H. Knapp, Wolf Point, Montana, has been elected president of the Northeastern Montana Medical society to succeed Dr. F. M. Knierim, Glasgow. Other officers are: Dr. O. G. Benson, Plentywood, vice-president, and Dr. T. L. Krogstad, Wolf Point, secretary-treasurer.

Dr. F. F. Attix, Lewistown, Montana, was re-elected to the board of governors of the American College of Surgeons at the 30th annual congress of the association which he attended.

Dr. H. Russell Brown, Watertown, South Dakota, is the newly elected president of the Watertown District Medical society. Other officers are: Dr. A. Einar Johnson, vice-president; Dr. Myron W. Larson, secretary-treasurer; Dr. O. S. Randall, delegate to the state medical meeting; Dr. J. B. Vaughn, retiring president, alternate delegate; and Drs. M. C. Jorgenson, G. Richards, and W. G. Magee, censors.

Dr. H. E. Neve, Bismarck, is now practicing at Hope, North Dakota.

Dr. A. R. Sievers, Butte, Montana, was elected president of the Silver Bow Medical society at the annual meeting held December 4.

Dr. Joseph F. Borg, St. Paul, Minnesota, is the new president of the Ramsey County Medical society.

Dr. E. M. Baldigo, formerly of Shakopee, Minnesota, is now practicing in Red Wing where he is associated with Dr. Donald R. Claydon.

Dr. E. J. Nelson, Owatonna, Minnesota, has been elected chief of staff of the Owatonna city hospital.

New officers of the Seventh District Medical society (South Dakota) are as follows: Dr. Edwin S. Stenberg, president; Dr. O. Charles Ericksen, vice-president; Dr. H. R. Hummer, secretary. Delegates are Dr. L. G. Leraan, 3 years; Dr. Goldie Zimmerman, 2 years; Dr. L. J. Pankow, 1 year. Alternates: Dr. S. A. Donahoe, 3 years; Dr. G. A. Stevens, 2 years; Dr. O. V. Ophem, 1 year.

Dr. L. A. Nash, who recently completed his fellowship in radiology at the Mayo Foundation, Rochester, Minnesota, is now radiologist at St. John's Hospital, Fargo, North Dakota.

Dr. Robert D. Radl, Bismarck, has taken over his duties at Fraine barracks as state medical officer for the selective service program in North Dakota.

Dr. T. B. Moore, Jr., Kalispell, Montana, is the new president of the medical staff of the Kalispell General hospital.

Dr. Agnes Keegan was elected president of the Aberdeen (South Dakota) District Medical society at the annual meeting December 10, 1940. She succeeds Dr. P. V. McCarthy. Dr. F. H. Cooley was named vice-president and Dr. I. L. Schuchardt, secretary.

Dr. W. A. George, Selby, South Dakota, was elected president of the Northwest District Medical society at a meeting held December 24. Other officers are: Dr. J. E. Curtis, Lemmon, vice-president; Dr. C. L. Olson, McIntosh, secretary-treasurer; Dr. A. W. Spiry, Mobridge, delegate; and Dr. C. E. Lowe, Mobridge, councillor.

Dr. Robert Woodhull of Morgantown, West Virginia, has joined the staff of the Northwest Clinic in Minot, North Dakota, according to a recent announcement by Dr. A. L. Cameron, chief of staff. A specialist in obstetrics and gynecology, Dr. Woodhull interned and was a resident physician at the Wisconsin General Hospital, Madison.

National Social Hygiene Day will be observed for the fifth time on February 5, 1941, Dr. Walter Clarke, executive director, the American Social Hygiene Association, has announced. Fifth Social Hygiene Day will be the spearhead of a concerted drive to safeguard men in military and naval training camps and in essential industries from the ravages of venereal disease. The effort this year is aimed at reducing commercialized prostitution to a minimum and keeping syphilis and gonorrhea infection rates as low as possible in army, navy and defense industrial personnel. Plans for the annual event include more than 5,000 community meetings in all parts of the country and four regional conferences to be held in Philadelphia, St. Louis, New Orleans and Los Angeles.

In response to an apparent demand, the Annual Forum on Allergy was founded three years ago by a group of outstanding allergists in the middle west to afford a forum in which to review the progress of Clinical Allergy. Annual meetings have been held in Toledo, Ohio, and Chicago, Illinois. This year the meeting will be held at the Claypool Hotel in Indianapolis on Saturday and Sunday, January 11 and 12, 1941. This offers to the internist, the pediatrician, the dermatologist, the otolaryngologist, and all other physicians an opportunity to bring themselves up to date in this field of medicine over a single week-end. All physicians in good standing in their local medical society are most welcome. There will be a small registration fee of five dollars.

The American Association for the Study of Goiter again offers the Van Meter Prize Award of three hundred dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The Award will be made at the annual meeting of the association which will be held at Boston, Massachusetts, May 26, 27 and 28, providing essays of sufficient merit are presented in competition. The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten double spaced copy sent to the corresponding secretary, Dr. W. Blair Mosser, 133 Biddle Street, Kane, Pennsylvania, not later than April 1.

The third joint meeting of the Tuberculosis Committee of the Minnesota State Medical association and the Meeker County Medical society was held in Litchfield on December 5 to discuss plans for the demonstration project for the eradication of tuberculosis to be conducted in Meeker county. Members of the state committee present were: Drs. J. A. Myers, chairman, and C. A. Stewart, both of Minneapolis; E. A. Meyerding, executive secretary of the Minnesota Public Health Association, St. Paul; H. A. Burns, superintendent of the state sanatorium, Ah-Gwah-Ching, and B. S. Adams of Hibbing, president of the Minnesota State Medical association.

Dr. E. W. Zeman, formerly instructor in pediatrics at the University of Nebraska medical school, has joined the staff of the Rood hospital in Hibbing, Minnesota.

New officers of the Madison District (No. 3) Medical society (South Dakota), are: Dr. Alonzo P. Peeke, president; Dr. J. A. Muggly, vice-president; Dr. D. S. Baughman, secretary and treasurer; Drs. L. E. Jordan and G. E. Whitson, delegates; Drs. H. A. Miller and E. T. Rorwick, alternates; Drs. M. C. Tank, G. H. Gulbrandson and E. S. Watson, board of censors.

Necrology

Dr. Joseph A. Piedalue, 81, Billings, Montana, died recently. Dr. Piedalue was believed to have been Montana's oldest practicing physician when he retired in May, 1936.

North Dakota State Board of Medical Examiners

North Dakota Naturopathic Physicians, Inc., Held to Be Illegally Attempting to Practice Medicine

On November 16, Judge D. B. Holt, Judge of District Court at Fargo, North Dakota, rendered his decision in an action brought by the North Dakota State Board of Medical Examiners of which Dr. W. C. Fawcett of Starkweather is president, against the North Dakota Naturopathic Physicians, Inc., and its officials, to enjoin them from practicing medicine in this state and to cancel the corporate charter as an illegal conspiracy to evade the law requiring those who practice medicine in this state to be licensed by an official board of the state.

Physicians and surgeons who practice medicine in this state must be examined and licensed by the North Dakota State Board of Medical Examiners. Osteopaths must be examined and licensed by the State Board of Osteopaths. Chiropractors must be examined and licensed by the State Board of Chiropractors. All of these boards are official state boards whose members are appointed by the Governor.

The North Dakota Naturopathic Physicians, Inc., is a private corporation, incorporated in this state in 1938 for purposes of examining and qualifying naturopaths to practice naturopathy in North Dakota. This private corporation proceeded to issue certificates to some of its members as registered naturopaths, and this corporation has required its members to file these certificates with the Register of Deeds in the county where they practice and to post the certificates in their offices.

In overruling a demurrer interposed by this private corporation to the complaint made by the North Dakota State Board of Medical Examiners, Judge Holt said that under the pleadings, the plain object and purpose of the defendants was to evade the statute regulating the practice of medicine and do indirectly what they could not do directly, namely, engage in the practice of medicine without having first secured a license from the Board of Medical Examiners, whose duty it is to regulate such practice.

The Court also held, through Judge Holt, that the attempt of the defendants to practice through the creation of a corporation constituted a fraud and was a palpable attempt to evade one of the statutory provisions of law in this state.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
ON NOVEMBER 8, 1940

OCTOBER EXAMINATION


Name	School	Address
Aita, John Andrew	U. of Iowa, M.D. 1937	Mayo Clinic, Rochester, Minn.
Albers, George Donald	U. of Mich., M.D. 1939	Mayo Clinic, Rochester, Minn.
Anderson, Charles Duncan	U. of Western Ont., M.D. 1939	Mayo Clinic, Rochester, Minn.
Anderson, Earl Melvin	U. of Minn., M.B. 1940	Mpls. General Hospital, Minneapolis, Minn.
Arling, Philip Arthur	U. of Minn., M.B. 1940	Miller Hospital, St. Paul, Minn.
Bratholdt, James Wollard	U. of Minn., M.B. 1938, M.D. 1939	3129 James Ave. S., Minneapolis, Minn.
Brown, Murray Hunter	Yale U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Brown, Schuyler Pillsbury	U. of Minn., M.B. 1940	University Hospital, Minneapolis, Minn.
Burnham, Wesley Howard	U. of Minn., M.B. 1939, M.D. 1940	Mpls. General Hospital, Minneapolis, Minn.
Carryer, Haddon McCutchen	Northwestern, M.B. 1938, M.D. 1939	Mayo Clinic, Rochester, Minn.
Catinella, Paul Joseph	Tufts Univ., M.D. 1936	Mayo Clinic, Rochester, Minn.
Dahlstrom, Doris Elizabeth	U. of Minn., M.B. 1939	Mpls. General Hospital, Minneapolis, Minn.
Davies, Louis Tookey	U. of Neb., M.D. 1939	Mayo Clinic, Rochester, Minn.
Ehni, George John	Northwestern, M.B. 1939, M.D. 1940	Mayo Clinic, Rochester, Minn.
Fenstermacher, Richard Henry	Jefferson Med. Col., M.D. 1937	Mayo Clinic, Rochester, Minn.
Geissler, Gerald George	U. of Minn., M.B. 1939, M.D. 1940	Co. 2713, V.C.C., Camp N. P. 1, Hinckley.
Glomset, Daniel Anders	U. of Chicago, M.D. 1938	Mayo Clinic, Rochester, Minn.
Hallenbeck, George Aaron	Northwestern, M.B. 1939, M.D. 1940	Mayo Clinic, Rochester, Minn.
Hartig, Marjorie Eunice	U. of Minn., M.B. 1939, M.D. 1940	University Hospital, Minneapolis, Minn.
Higginson, John Francis	Columbia, P. & S., M.D. 1937	Mayo Clinic, Rochester, Minn.
Honke, Richard Wunnibald	Creighton U., M.D. 1938	Proctor, Minn.
Iverson, Rolf Marshall	Northwestern, M.B. 1937, M.D. 1939	Mayo Clinic, Rochester, Minn.
Janssen, Martin Ernest	Rush Med. Col., M.D., 1939	St. Luke's Hospital, St. Paul, Minn.
Judd, David Berkman	U. of Minn., M.B. 1939, M.D. 1940	Mayo Clinic, Rochester, Minn.
Kelly, John Francis	U. of Minn., M.B. 1940	Miller Hospital, St. Paul, Minn.
Leveroos, Edward Herbert	U. of Minn., M.B. 1940, M.D. 1940	2331 Ogden Ave., Superior, Wis.
Lofsness, Stanley Vincent	U. of Minn., M.B. 1938, M.D. 1939	119 Inst. of Anatomy, U. of Minn., Mpls.
Luckey, Clarence Andrew	U. of Neb., M.D. 1939	Mayo Clinic, Rochester, Minn.
Lyman, Richard Watson	U. of Oregon, M.D. 1939	Mayo Clinic, Rochester, Minn.
Nelson, Clayton Everett Jonas	U. of Minn., M.B. 1940	Bethesda Hospital, St. Paul, Minn.
Olson, Stanley William	U. of Ill., M.D. 1939	Mayo Clinic, Rochester, Minn.
Pender, John William	Tulane U., M.D. 1935	Mayo Clinic, Rochester, Minn.
Petit, Julian Victor	U. of Minn., M.B. 1940	Northwestern Hospital, Minneapolis, Minn.
Petkevich, Frank Michael	U. of Chicago, M.D. 1937	1365 Willow St., Minneapolis, Minn.
Pleissner, Karl William	U. of Minn., M.B. 1940	2647 Chicago Ave., Minneapolis, Minn.
Ponterio, James Edmund	Creighton U., M.D. 1940	St. Joseph's Hospital, St. Paul, Minn.
Potter, Robert Tippet	U. of Minn., M.B. 1939	4036 Queen Ave. S., Minneapolis, Minn.
Pratt, Joseph Hyde, Jr.	Harvard U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Pruitt, Raymond Donald	U. of Kansas, M.D. 1939	Mayo Clinic, Rochester, Minn.
Rogers, George Edward Brien	U. of Toronto, M.D. 1938	University Hospital, Minneapolis, Minn.
Rushmer, Robert Frazer	Rush Med. Col., M.D. 1939	Mayo Clinic, Rochester, Minn.
Schulze, William Matthew	U. of Minn., M.B. 1939, M.D. 1940	1025-29th Ave. N. E., Minneapolis, Minn.
Schwytzer, Arnold Gustav	Johns Hopkins U., M.D. 1939	8 Crocus Hill, St. Paul, Minn.
Sluder, Fletcher Sumpter, Jr.	Rush Med. Col., M.D. 1938	Mayo Clinic, Rochester, Minn.
Smith, Frank Baker	McGill Univ., M.D. 1937	Mayo Clinic, Rochester, Minn.
Strough, LaVern Craig	U. of Neb., M.D. 1939	University Hospital, Minneapolis, Minn.
Sutton, Janet Beth	U. of Minn., M.B. 1939	Mpls. General Hospital, Minneapolis, Minn.
Wise, Ralph Waldo Emerson	U. of Iowa, M.D. 1939	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Blum, Otto Schindler	U. of Wis., M.D. 1929	1614 Badger St., La Crosse, Wis.
Chesley, Ward Bennett	U. of Mich., M.D. 1937	Lenont-Peterson Clinic, Virginia, Minn.
Galloway, John D. Brown	Temple U., M.D. 1934	2404 Clinton Ave., Minneapolis, Minn.
Hausmann, Paul Frederic	Northwestern, M.B. 1938, M.D. 1939	Mayo Clinic, Rochester, Minn.
Mulmed, Earl I.	U. of Okla., M.D. 1937	Mayo Clinic, Rochester, Minn.
Nielsen, Ariel Elias	U. of Louisville, M.D. 1936	704 E. Center, Douglas, Wyo.
Noble, Philip Cornelius	Rush Med. Col., M.D. 1929	500 Harvard St. S. E., Minneapolis, Minn.
Patch, Orien Bailey	Western Reserve, M.D. 1935	1732 E. 4th St., Duluth, Minn.
Person, John Paul	U. of Neb., M.D. 1934	Alden, Minn.
Rosenbaum, Edward E.	U. of Neb., M.D. 1938	Mayo Clinic, Rochester, Minn.
Rosenberg, Charles Freelan	U. of Wis., M.D. 1936	15 E. Gorham St., Madison, Wis.
Zeman, Edward William	U. of Neb., M.D. 1936	502 S. 36th St., Omaha, Neb.

NATIONAL BOARD CREDENTIALS

Boyd, Edith	Johns Hopkins, M.D. 1921	University Hospital, Minneapolis, Minn.
Flannary, Hubert Farber	Rush Med. Col., M.D. 1939	St. Cloud Hospital, St. Cloud, Minn.



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New Series

Remote Vascular Lesions of the Toxemias of Pregnancy and Their Clinical Significance*

John L. McKelvey, M.D. C.M.

Minneapolis, Minnesota

IT has become evident that the most serious aspect of the toxemias of pregnancy in terms of both morbidity and mortality lies with changes of a permanent character which produce their lethal effects long after the primary damage. Subsequent pregnancies almost always advance this damage and increase the seriousness of the prognosis. This condition has been called "chronic nephritic toxemia of pregnancy" and it might be well to define exactly what is meant before passing to a discussion of the lesions and their effects.

It has long been noted that there is a type of toxemia which recurs in each pregnancy manifesting more severe signs and symptoms and beginning earlier in the course of pregnancy in each recurrence. It tends at some time in its course finally to end in uremia and death. The eye-grounds eventually show the changes described as renal retinitis and this, with the uremia, has led to confusion in diagnosis with the end result of chronic glomerulo-nephritis. This toxemia was named by Stander "chronic nephritic toxemia." The term has led to further confusion. It is now known that this condition is a vascular disease manifesting itself primarily in the arterioles and is indistinguishable from essential hypertension. The major symptoms and findings vary in degree and in distribution over widely scattered areas although the kidney, as the most sensitive structure involved, may be relied upon to manifest disturbances. It must be remembered, however, that this is only one manifestation of a generalized disease process. Hyper-

tension and/or albuminuria are the earliest findings. The persistence of these findings in the non-pregnant state is diagnostic of the condition in the absence of other obvious causes for these findings. The disease is entirely different from glomerulo-nephritis in its pathology and in its significance as a complication of pregnancy. Various terms have been given to this condition in the non-pregnant individual. Among others, essential hypertension, benign and malignant nephrosclerosis for different stages of the process and arteriosclerosis have been used. The latter is chosen as most descriptive. Stander has coined the term "chronic nephritic toxemia of pregnancy" and these two will be used for the same process. The disease is well known and much studied outside its relation to the toxemias. For some reason this relationship has not been widely recognized.

The arteriosclerosis may precede the first pregnancy. Thus, a patient suffering from essential hypertension, not developed in pregnancy, may become pregnant. The disease may result from the damaging effects of such a toxemia as eclampsia. It may apparently appear in its clinical manifestations as the result of pregnancy superimposed upon as a deficient vascular system, a latent essential hypertension requiring only some such damaging effect to make it clinically evident. All of these types of onset produce a disease process which may vary in degree and speed of development, but in all, the disease is the same.

The patient, then, may be clinically normal at the beginning of pregnancy. The urine may be free of

*From the University of Minnesota.

albumin; the blood pressure, both systolic and diastolic, within normal levels; and the vessels of the eye-grounds show no change. Evidences of one or another form of toxemia appear usually in the last half of pregnancy. After delivery hypertension and/or albuminuria persist. Blood pressure above 140 mm. Hg. systolic and/or, what is still more important, above 90 mm. Hg. diastolic, and/or traces of albumin in the catheterized urine are abnormal findings. Proliferative arteriolar damage is now established and a pathological process which is indistinguishable from that of essential hypertension begun. In this group, it is sometimes difficult to say whether subclinical arteriolar damage or deficiency preceded the pregnancy or arose as a result of the toxemia. The former is suggested by the striking frequency of cardiovascular disease in the parents of these patients. More work is required to establish this, but the taking of family histories may be of the greatest interest and importance. Certainly the observation and recording of blood pressure and urinary findings at an interval of at least six weeks postpartum is a *sine qua non* of adequate obstetric care. These findings will be of the utmost importance in differential diagnosis of conditions arising in subsequent pregnancies.

The patient who has now developed a hypertension unassociated with pregnancy and/or albuminuria unassociated with pregnancy falls into the same clinical group with those who begin their first pregnancies with an established essential hypertension. In subsequent pregnancies, increases in the degree of these findings will occur earlier and earlier in the course of the pregnancy. The arteriolar damage becomes more and more advanced. In some patients the advance is rapid, in others slow. This carries a racial relationship in that the speed of advance in the negro is greater than that in the white, but similar variations occur in the single racial group. There is yet no method of accurately determining the sensitivity of response of a given patient, although the "cold test" of Brown or a modification of it offers a reasonable hope in this regard. It can be said, however, that every pregnancy advances the arteriolar lesion. Other conditions than pregnancy may also advance the lesion, and, in this regard, it is entirely similar to essential hypertension in the male or the nulliparous female.

Kidney function is normal to all tests save pregnancy until the terminal stages of the disease, when uremia and the clinical picture is unmistakable. The amount of urinary albumin is small except for exacerbations during pregnancy and in the terminal stages. There is usually much less albumin in the urine of the arteriosclerotic toxemia than in that of the acute pregnancy toxemia of a similar degree of hypertension. Blood chemistry studies are normal save for normal pregnancy variations until the terminal stages.

The ophthalmoscopic examination of the retinae is of the greatest value in the differential diagnosis. In the very early lesion, attenuation of the vessels may be difficult to differentiate from the functional spasm of other toxemic forms. Repeated careful observation will usually settle the question as to whether one is dealing

with organic disease or functional spasm. The differentiation between moving localized spasm and fixed irregularities due to arteriosclerosis may be readily made on repeated examination. Where the differentiation between organic and functional disturbances is difficult, and where other findings do not lead to a differential diagnosis, the proliferative disease is so early that palliative therapy and observation is quite in order.

The advanced stages of arteriosclerosis which show in the retinal vessels tortuosity, gross irregularities of size, arteriovenous crossing phenomena and still later, these associated with retinal exudates, are readily recognized. Retinal hemorrhages may occur at any stage of development and represent a grave prognostic sign.

It would appear evident that the care of the toxemias of pregnancy is incomplete unless it includes careful observation of the eye-grounds. One should remember that the retinal arterioles represent only a sample of the general arteriolar system. All parts are not necessarily equally affected. Disease processes elsewhere may be either more or less advanced. By and large, however, there is a reasonably similar process in similarly sensitive arterioles elsewhere. The arterioles of the kidney in particular and those in the retina are fairly equal in sensitivity.

Consideration has been given, then, to the role of pregnancy in the production of arteriosclerosis and it has been pointed out that pregnancy always advances the lesion. It is entirely possible, however, that patients may undergo multiple pregnancies without destruction. Conversely, in others, pregnancy may produce a speedy progression of the disease with ultimate destruction. In some individuals, where pregnancies do not supervene, the condition may remain at a fairly stable level for long periods of time. In others, even in the absence of subsequent pregnancies, the disease may progress to a fatal issue. The condition follows the general course of essential hypertension. One can only say that of all the known exacerbating agents, pregnancy is the most certain and severe. Since every pregnancy makes this condition worse, it seems reasonable to assume that the pregnancy is normal and that the abnormal vascular system is the basis of the disturbance. Since the disturbance is in many ways similar to the acute toxemias, the question naturally arises as to whether in these, too, the pregnancy may not be normal and the toxemia, the result of an abnormal vascular response. There is no satisfactory answer to this doubt at present but it does seem that the conclusion that the pregnancy itself is at fault has been too hastily drawn.

Not only does the pregnancy affect the arteriosclerosis but the pregnancy itself may be prejudiced by the toxemia. The major effect lies in the production of the condition known as premature separation of the normally implanted placenta or *ablatio placentae*. The incidence of this fairly closely parallels the severity of the arteriosclerosis and the height of the blood pressure. There is a much greater incidence of premature separation of the placenta in this type of toxemia than in equally severe grades of the other forms of toxemia.

The incidence is great in severe arteriosclerosis and increases with the advancing duration of pregnancy. Occasionally, cesarean section before term is indicated in the interests of the child under these circumstances.

It is not to be understood that all premature separation of the normally implanted placenta is on an arteriosclerotic basis nor, indeed, is an hypertensive toxemia necessary under any circumstances. Only about half of the cases of premature separation show any evidence of toxemia whatever.

Immediate differential diagnosis in mild cases may not be easy. A knowledge of the blood pressure and urinary albumin before pregnancy is of the greatest value here. Hypertension and/or albuminuria unassociated with pregnancy allows a diagnosis of the arteriosclerotic form of toxemia when chronic glomerulonephritis, other primary kidney and cardiac diseases which are rare, and a few very rare vascular diseases are ruled out. It must only be remembered that pre-eclampsia and eclampsia may be superimposed upon this. Smaller amounts of albumin and lesser degrees of edema than those usual to acute forms of toxemia showing similar blood pressure levels is suggestive of arteriosclerosis. The appearance of hypertension and/or albuminuria in early pregnancy is usual in the latter and unusual in the former. Recognition of organic lesions in the retinal vessels will be decisive. In the mildest cases it may be necessary to withhold a final decision until six weeks postpartum when the persistence of a systolic blood pressure of 140 mm. Hg. and/or diastolic of 90 mm. Hg. and/or albuminuria allows a diagnosis of arteriosclerosis. In some cases, it may be difficult to decide whether the arteriosclerosis was primary or whether it developed as a result of another form of toxemia. This, however, is only of academic interest.

One may be skeptical of the value of a diagnosis which can only be made long after the pregnancy is concluded. It should be made clear that this difficulty arises for the most part only in milder forms of the toxemias which are not indications for active interference.

A decision as to a residual arteriosclerosis after a pre-eclampsia or eclampsia must often be put off until six weeks postpartum. Occasionally one is surprised at the complete disappearance of evidences of an abnormality at that time in such conditions as those of an eclamptic who is discharged before the blood pressure and urinary findings have returned to normal. Occasionally, the reverse occurs and a patient discharged with apparently normal findings returns with evidence of arteriosclerosis. It cannot be stressed too much that observations following pregnancy on patients who have had toxemias of pregnancy are of great and often decisive importance in differential diagnosis.

Relatively few of these patients die during pregnancy, and this perhaps explains the lack of observations by obstetricians on the ultimate outcome. Only very advanced lesions with high blood pressure and advanced vascular lesions fall into uremia and die during pregnancy. On the other hand, the lesion in its less advanced stages is very frequently seen. About one-third

of the total toxemias seen in clinic practice are of this nature. One-quarter of eclamptics may be shown to develop arteriosclerosis. Page and Cox, in 1938, collected from the literature and their own clinic, details of 3,800 patients who had had hypertensive toxemias of pregnancy. Of these, 43 per cent showed residual hypertension.

The actual remote mortality from arteriosclerosis is disputed, but it is clear that accurate and prolonged observation will yield surprising results. The best of the studies in this country have been carried out at Johns Hopkins Hospital. These show that in the ten-year period following a diagnosis of arteriosclerotic toxemia, 25 per cent of the patients die. The standard insurance mortality tables show an expected death rate of 7.5 per cent for women in the ten year period of ages 30 and 40 and the figure obtained after deducting this, i. e. 17.5 per cent, represents the death rate due to arteriosclerosis. If one or more pregnancies follow a diagnosis of arteriosclerosis, the ten-year mortality jumps to 47 per cent, i. e., 40 per cent due to the vascular lesion.

It is true that this is based upon material, half of which was made up of negro patients. It is fairly generally agreed that the negro dies about ten years earlier of vascular disease than the white and the results may be exaggerated on that basis. It is also true that these studies represent clinic practice with the clear concentration of severe material inherent in that type of work. The difference will, however, be one of degree.

It changes in no way the fact that the remote mortality, to say nothing of the morbidity of this disease, is great. Its end results are certainly more severe than those of eclampsia which is generally assumed to be the most dangerous form of the toxemias. Obstetricians must consider these remote effects, and in particular, the effects of pregnancy upon the ultimate prognosis of an established arteriosclerosis. Results in tumor therapy are considered on a five-year basis. Here one should be able to express oneself in terms of ten-year mortality rates.

What is this disease and how does it progress? Early lesions are available in autopsy material on a relatively few patients who have died of some other cause. One must remember that arteriosclerosis is a proliferative lesion and time will be required after the original cause for its morphological characteristics to develop. Degenerative lesions as those of the tubulo-glomerulonephrosis of eclampsia can appear almost at once. Periods of months, at least, are required before the proliferative vascular lesions, to be described, may be expected to appear.

The early lesion shows a proliferation of the tissues forming the walls of the arterioles. There is thickening of the adventitia, thickening and fibrosis of the muscular media, splitting and reduplication of the internal elastic lamina and proliferation of the subendothelial connective tissue. Two distinct effects on the size of the lumen are produced. In the larger arteriole there is actual enlargement of the lumen, a surprising effect. This amounts to a dilatation at this level and will pass the pressure,

normal to this level, on to the smaller arterioles. These latter show a contraction of the lumen and this is of sufficient degree to more than compensate for the dilatation above. As a result, the field resistance is increased and an increase in blood pressure is necessary to overcome it. These changes are not spread uniformly throughout the body, but are seen best in the kidney, also in the adrenal, pancreas and central nervous system and to a lesser degree in the arterioles of the gut. There is no other significant lesion in the kidney at this stage except that described in its arterioles. These are the lesions of essential hypertension.

This condition persists with an extension of the lesions described for varying periods of time and perhaps indefinitely. In those who die, there is a sudden elevation of blood pressure, the appearance of symptoms and uremia set in. New necrotizing lesions of the arterioles appear, particularly in the kidney. Rupture, saturation of the walls with plasma and aneurysmal dilatation of the afferent arterioles to the glomerulus may be seen. The reader is referred to special works for finer details. This lesion is that which Volhard and Fahr described as malignant nephrosclerosis. It is quite different from the lesions of chronic glomerulonephritis. In the latter a large part of the architecture of the kidney is destroyed. In malignant nephrosclerosis, in spite of the fact that uremia has developed, 90 per cent of the glomerular architecture closely approximates the normal.

The treatment is largely a matter of prevention. That this cannot be carried to an ideal end requires no argument. It must be remembered, however, that pregnancies implanted upon an already established arteriosclerosis are the severest known exacerbating agents and will uniformly decrease the patient's life expectancy.

It seems clear that for every day a patient is allowed to continue with a toxemia of pregnancy showing hypertension and/or albuminuria, the chance of the establishment of permanent vascular change is increased. One must carefully weigh the advantages of continuation of the pregnancy against this fact. Induction of labor before term may be the method of choice.

It seems clear that no patient with an established arteriosclerosis should be advised to undertake pregnancy. Occasionally, interruption of early pregnancy is justified in the presence of this disease. As was pointed out above, premature termination of pregnancy may be the method of choice in late pregnancy for the sake of the child as well as of the mother. No known method of therapy is effective in preventing the exacerbation of

the condition during pregnancy. Sterilization is obviously indicated where interruption of pregnancy has been carried out, in view of the fact that the disease does not regress and further pregnancies will reproduce the indications which led to previous interruption. It is the author's opinion that if early recognition of the lesion and appropriate sterilization were carried out, the dreadful remote mortality of the disease might be somewhat lessened.

This condition should be carefully distinguished from active or advanced glomerulonephritis. In the presence of nephritis, from whatever cause, pregnancy will, for practical purposes, always lead on to uremia and death. Occasionally these patients abort spontaneously in time to save themselves. In particular, careful watch should be kept on patients suffering from pyelitis of pregnancy in order to recognize and treat at the earliest possible moment an extension to the production of a clinical pyelonephritis. The appearance of drowsiness, increased protein metabolites in the blood, early interference with kidney function, renal acidosis, etc., are the hallmarks of this condition. Acute glomerulonephritis needs no description here.

The various forms of nephritis may heal under adequate therapy and subsequent pregnancies may then be undertaken without the expectation of difficulty provided, as is usual in young people, sufficient kidney parenchyma is left to carry on function. This is in striking contrast to arteriosclerosis in which, once established, the disease process advances with each pregnancy.

Chronic glomerulonephritis is seldom an obstetrical problem. It tends to occur in later life and is associated with malaise, anemia, interference with nutrition, etc., all of which make it unusual for conception to occur. If pregnancy does supervene, the problem is similar to that in acute nephritis.

To sum up the problem one might say that this condition called "chronic nephritic" toxemia is arteriosclerosis. The vascular lesion may precede a pregnancy or follow a toxemia of pregnancy. It is necessary and readily possible to differentiate it except in the very mildest forms from the toxemias described as low reserve kidney and pre-eclampsia. It has little or nothing in common with glomerulonephritis and the results, present and remote, are quite different. Pregnancies superimposed upon arteriosclerosis always advance the disease. The remote mortality is more severe than that of any other type of toxemia of pregnancy.

Appendicitis and Its Treatment

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THE pendulum of time and experience in medicine swings to and fro between radicalism and conservatism. In acute perforated appendicitis it swings back and forth between immediate surgery and the medical or delayed Ochsner treatment. At the present time, from a perusal of the literature, it seems as though conservatism has the upper hand. Adherence to this trend will not improve the morbidity and mortality, and has grave possibilities of starting them on the increase.

A timely analysis of cases, pre- and postoperative care, methods and technic of operative procedures, and operators themselves, might reveal many factors which would change the best figures. The Ochsner medical regime has a definite place in a few selected cases, i. e., the desperately ill, three-day-old purged ones with high fever and generalized peritonitis, Hippocratic facies, and dehydrated bodies. These had better be given treatment to restore their depleted reserve for possible surgery later. Such patients have become constitutionally ill and the appendiceal process is a secondary factor. One does not operate for peritonitis.

For convenience, one might subdivide acute appendicitis into three types, i. e., early, late, and middle, or those falling between the two extremes. This paper is principally concerned with the latter type. The selection of these cases is a delicate and grave task. A warning is issued to the surgeon or internist who supplants methods or technic for diagnostic skill and sound judgment. As a means of preventing the first and second type becoming third type cases, the following procedures are recommended:

ANESTHESIA

Many cases can be successfully treated under local anesthesia. The desperately ill and abscess cases should be given infiltration anesthesia when at all feasible; but, due to the limited anesthetized field, its routine usage is apt to be unsatisfactory. As in other intestinal surgery, complete relaxation is desirable not only for the surgeon's benefit, but for the patient's welfare. Spinal anesthesia is the only method that brings about this desirable state. Only deep ether anesthesia approaches the spinal relaxation. Even a moderate amount of this deep ether depressed state is quite shocking. An appendectomy done with spinal through a McBurney incision is much easier and safer, technically, to accomplish than through a large median incision with partial relaxation. Rigidity is not a troublesome factor in children so that inhalation anesthesia is quite satisfactory.

INCISION

Outstanding in the methods advocated for the reduction of the mortality in appendicitis stands one procedure which has withstood the test of time. Occasion-

ally, a writer brings this principle forth as something new when actually the principle is as old as the practice of surgery itself. An inflamed appendix is, or potentially is, an abscess. No one would think of opening an abscess elsewhere in the body by a distant side approach; nor would he choose a spot where nerves, blood vessels, muscles, and fascial spaces are abundant; and least of all would he select an incision in such a location that there could be no drainage. The age-old admonition for draining an abscess is directly into the abscess over the shortest route, through the region of fewest blood vessels and nerves, avoiding opening new avenues for spread of infection, the fascial spaces, and in that spot best adapted to dependant drainage. If one follows this principle, one makes a McBurney or gridiron incision. Any operative procedure which so well fulfills these sound principles of surgery, which produces a postoperative hernia in only one in 1,500 clean cases, allows the patient up the third day or sooner, and home the fourth, and consistently reduces the mortality one-half deserves to be a routine in all cases. This includes all cases where there is a possibility that the acute pathology at hand might be an acute appendix. Arguments against this being a first and routine incision in questionable cases have little grounds. The acute questionable abdomen is an acute appendicitis in most cases. If the condition is pelvic inflammatory in nature, it is left alone, and the incision causes little or no harm. Should the pelvic condition be such as cannot be handled through an enlarged McBurney incision, the latter can easily and safely be closed and a new opening made. This applies also to perforated ulcers and gallbladders. For the latter, the McBurney incision makes a good outlet for drains placed along the ascending colon.

TECHNIC

Non-perforated acute appendicitis:— No rule holds absolutely in the practice of medicine, but the rule to operate or advise operation when the diagnosis of acute appendicitis is made is as definite as any there is. Most surgeons have developed a technic of their own for this type of case, and as a rule all have gratifying results. Mention will be made of the Ochsner technic for those who wish a consistently smooth, pleasing, and comparatively painless convalescence. The controversy between simply tying off the stump without inversion, tying off the stump and invagination, and inversion without tying off the stump still goes on. Here again, tried and accepted surgical methods used elsewhere in the abdomen should be used. No one would think of tying and cutting the bowel and dropping it back into the abdomen, nor would anyone invaginate a tied stump of the end of a bowel and leave it thus. This would be expected to heal with an abscess formation. Why is it no one thinks the clamped and tied stump of an appendix, and this

tied with chromic catgut, does not heal by abscess formation? In closing the wound using No. 1 plain catgut in the peritoneum, external oblique and internal oblique fascia with No. 0 plain catgut in Camper's and Scarpa's fascia, avoiding chromicized suture entirely, it will be observed that postoperative wound drainage will be rare indeed.

EXPLORATORY

After all diagnostic ability has been used and still there is indecision as to whether or not there is a spreading peritonitis present, an accurate diagnosis can be made through a McBurney incision. Little harm would occur by a look under local anesthesia. An open pack drain might be an asset in the Ochsner treatment. Valuable statistics might be obtained from a collection of such cases where just this procedure has been carried out.

ABSCESS

A treatise on the treatment of appendiceal abscess has been admirably presented by J. O. Bower. The essentials are the opening of the abscess through a lateral incision into the point of fluctuation. Gently insert a drain and do no more. Here, there is a temptation to remove the appendix. This is meddlesome surgery and should not be done. With a McBurney incision and remaining lateral to the cecum no contamination or breaking down of protective walls will occur. This is only carrying out an age-old surgical procedure, i. e., draining an abscess in the simplest, easiest, and safest manner, doing only what is necessary, and leaving well enough alone.

RUPTURED APPENDIX

Most surgeons would not operate upon the ruptured appendix, preferring to use the conservative Ochsner therapy. Yet, anyone operating upon a case of acute appendicitis encounters this condition even though he may try to avoid it. It is my belief that an early ruptured appendix of less than twelve hours—preferably less than six—is best treated by surgery. It is here that a technic determines life or death for the patient. I believe by carrying out the following technic the morbidity of ruptured perforated appendicitis can be greatly lowered—if it does not approach that of the non-perforated type. The McBurney incision is the first essential step; next, only the cecum and appendix are gently brought into view, packing off the remainder of the abdominal cavity with small, moist sponges.

The appendix is removed as near the cecum as possible, a 16 or 18 French rubber catheter is inserted into the stump and, if easily accomplished, through the ileocecal valve. If the cecal tissue is firm enough, a purse string suture is placed about the catheter. Two Penrose drains are inserted; one into the pelvis and one cephalically lateral to the cecum. Six twisted gauze wicks about eight inches long are placed about the catheter. The hand part of a rubber glove is neatly wrapped about the Penrose drains, gauze wicks, and catheter, thereby isolating the abdominal cavity from the drains. The peritoneum is closed fairly snug about the rubber sleeve. The abdominal wound is loosely closed by two non-absorbable

sutures, placed near the drain and traversing only skin and the fascia of the external oblique. This is to prevent possible evisceration with no intention of approximation; in other words, the wound is left wide open. In three or four weeks all of these wounds heal remarkably well, but most of them will eventually develop a postoperative hernia or weakness at this spot. However, the repair is quite easy and permanent, as there is no fascial slough which always occurs in an infected wound in which gut sutures are used in an attempt at tight closure.

POSTOPERATIVE CARE

In the non-perforated or ruptured cases the patient is returned to bed, given sedatives as necessary for pain, and fluids by mouth as soon as tolerated. The first day 1,000 cc. of normal saline is given subcutaneously or intravenously. The patient may sit up or stand up to urinate in ten or twelve hours if necessary and may be out of bed the fourth day and home the fifth if he feels so inclined.

In the abscess or ruptured case, the patient is placed on the right side or on the abdomen for 24 to 36 hours. Sedatives are given as necessary for pain, but nothing is allowed by mouth. One thousand cc. of 10 per cent glucose are given intravenously, twice daily, and 1,000 cc. normal saline given subcutaneously. The quantity of fluid is increased or decreased as the need may be. Sulfanilamide is given in therapeutic dosage. The most convenient form is Prontysil 5 per cent, 20 cc. every four hours for six doses, then 10 cc. every four hours for another day or two. A prophylactic or therapeutic dose of gas bacillus antitoxin given after operation in all cases of ruptured appendicitis has more rationale than the routine administration of the same in puncture wounds.

The catheter is connected to a bottle for drainage with gentle irrigations of 30 cc. of water every two or three hours to prevent plugging. I have not seen distention occur in these cases, the cecal tube preventing this. Should it occur, the Wangenstein syphonage suction could be supplemented, using a duodenal tube or the Miller-Abbott double lumen tube. Repeated small blood transfusions should be used early instead of as a last resort.

SUMMARY

The climbing mortality rate in acute appendicitis may be due to improper selection of cases for the Ochsner treatment, to poor surgical technic, or to inadequate postoperative care. Statistics bearing on this subject are altered by so many factors that one cannot arrive at definite conclusions. A plea is made for conservative use of the conservative or Ochsner treatment. Method of treatment is given based on age-old surgical principles. These are: (1) the diagnosis should be exacting and paramount, not overshadowed by dependence upon method or technic; (2) the operative procedure should be simple, adequate, gentle, and based on the principles of treating an abscess elsewhere in the body; (3) the free drainage for the abdominal cavity, bowel, and wound should be instigated; (4) rational supportive measures should be maintained postoperatively.

Sterility Investigation*

A Plan for Study and Treatment

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STERILITY investigation holds wide medical interest. There are few of us perhaps who are not questioned concerning this subject from time to time. Naturally the gynecologist encounters the most cases. However, a sterility investigation may be conducted by the general practitioner, and it may entail the services of the urologist, gynecologist, general surgeon and internist. A patient seeking information on sterility is entitled to an intelligent investigation. The consulting physician, if unable to give this, must surely recognize his responsibility and direct the patient into the proper channels. Many patients have the notion that a search for the causes of sterility can be settled at one visit between trains. Furthermore, there are some physicians who give this search just that much time and thought while presuming to act as consultants on the subject. This is to be deplored. So frequently does one see patients who have had inadequate examinations and half measures in the treatment of this condition that I feel justified in formulating a brief plan for study. This subject is so broad that it is my aim merely to emphasize certain points and mention a few new concepts in treatment.

Generally speaking there are three causes of sterility or lack of fertility:

1. Defective germ plasm, ovulation or spermatogenesis.
2. Mechanical obstruction of the passage between the sperm and the ovum.
3. Unfavorable soil in the uterus for implantation of the fertilized egg.

PLAN FOR INVESTIGATION

1. *History.* Information concerning the menstrual cycle and sex habits is exceedingly important. While one cannot distinguish clinically between pseudomenstruation and true menstruation, one gets valuable data from the analysis of the length of interval, the amount and duration of flow, and the presence or absence of pain.

Whitehouse has stressed the difference between premenstrual pain and pain occurring during the actual flow. He states that the latter suggests a foreign body, such as a polyp, unshed endometrium or myoma, in the uterus; he finds premenstrual pain to be associated with a highly developed progesterational type of endometrium, the cells in the strata compacta simulating decidual cells, probably produced by too vigorous or too prolonged production of the hormone of the corpus luteum. Excessive duration of flow, that is, over five days, or an increasing amount of hemorrhage must always first suggest the presence of some lesion in the uterus or pelvic organs.

Campbell states that the length of the interval is

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probably the most significant single factor to be gleaned from the personal history; it is the rule that most women are convinced that their periods recur precisely every 28 to 30 days, when, in fact, accurate recording reveals considerable irregularity. In Campbell's experience it has been exceptional for a woman whose cycle is 27 days or less to become pregnant; it may be that fertilization occurs, but the embryo is aborted on the 27th day, not having become firmly established before luteal function regressed.

A history of sex habits usually reveals the frequency of coitus and the occurrence of libido, orgasm, and variations of sex desire in the cycle, but it is necessary from the standpoint of sterility to inquire particularly whether coitus occurs in the estimated fertile phase of the cycle. Stein has observed instances in which failure to conceive apparently was due to coitus restricted to the period before or after menstruation. A change in sex habit in this regard has resulted in conception. Many patients still believe that fertility reaches its maximum around the menstrual period, probably because libido is frequently greater at this time.

Patients are questioned concerning the previous use of contraceptive materials, particularly as to whether a vaginal method or intrauterine device was employed, and how long a period has elapsed since the patient ceased to use any contraceptive. It is also important to learn whether lubricants were being used to facilitate coitus inasmuch as the majority of lubricants in general use possess contraceptive qualities.

Most patients will deny a history of venereal disease, and indeed they may be unaware that they ever had such infection. Yet on inspection the examiner discovers such stigmata as inflamed Bartholin's or Skene's ducts, or a mucopurulent cervical discharge; such findings definitely influence his opinion and put him on the lookout for possible tubal damage or other sequelae of infection, important factors in the sterility picture.

Some patients who present themselves for the diagnosis of sterility do not require a complete investigation, for at times obvious pelvic pathology is discovered upon the first examination. This may be of such a nature as to establish definitely a diagnosis of an absolute sterility as in certain extreme grades of underdevelopment or conditions requiring radical surgical treatment. Moreover, the performance of semen examination may reveal an azospermia, which indicates a male absolute sterility. In such instances, except as a matter of interest and study, further investigation of the female partner is unnecessary unless artificial insemination with a donor other than the husband is contemplated. An interesting sidelight is the medico-legal status of a child so conceived. He must be legally adopted by the parents to establish legitimacy.

2. *Physical Examination.* (a) General. Thorough physical examination may occasionally reveal some contra-indication to pregnancy, such as cardiac or nephritic disease. Patients suffering from constitutional diseases incline to sterility. For example, women with diabetes rarely become pregnant unless the diabetes is mild or under insulin treatment.

(b) Gynecological examination. The genital status should be noted and evidence of developmental anomalies and of inflammatory disease particularly sought. In gynecological examination, the real infantile uterus is uncommon but various grades of hypoplasia are commonly encountered. The hypoplastic uterus is usually indicative of endocrine deficiency resulting in genital underdevelopment. Stein states the ovarian deficiency or immaturity which accompanies hypoplasia is indeed significant and may be directly responsible for the uterine condition. Other genital tract anomalies, such as those resulting from the errors of embryonal fusion, may escape detection upon pelvic examination to be discovered later in the investigation by means of X-ray examination. It is worth noting, however, that the ovarian development is usually not impaired in these various types of fusion defects, and consequently conception occurs more readily than in hypoplasia.

Multiple fibroids, tumors and cysts of the ovaries and inflammatory adnexal lesions may be discovered on bimanual examination. The inflammatory lesions may be a basis for absolute sterility.

Uterine displacements, such as retroversions and ante-flexions do not play so important a role in the etiology of sterility as was formerly believed. Acute ante-flexion is usually associated with hypoplasia and indicates that ovarian rather than uterine function is primarily at fault. Retroversion in itself is not, as a rule, a serious barrier to conception since many patients with uterine retroversion experience little difficulty in becoming pregnant.

3. *Huehner test.* If the history and physical examination reveal no cause, one proceeds to the Huehner test. This is a postcoital test, one of the easiest and most enlightening of our investigative procedures in sterility. By means of the test, one finds not only whether the male is fertile, but also learns to appreciate the obstacles which are naturally existent to the ascent of the spermatozoa. First of all, the vaginal secretion, which is normally acid, is inimical to long survival of the spermatozoa. This is perhaps the reason that nature deposits up to 300,000,000 male seeds in the female generative tract. The cervical secretion offers the next barrier in the ascent of the sperm. This secretion is normally alkaline and more compatible to the ejaculate. Thick or purulent mucus may, however, provide an impenetrable obstacle. One can observe the decided diminution in sperm motility when studying certain cervical specimens.

The Huehner test can be carried out in the office readily. The patient is instructed to have intercourse, then to apply a sanitary pad immediately and come to the office within an hour. With a pipette, semen is removed from the vagina and cervix for microscopic ex-

amination. Two hundred to 500 sperms per high power field with more than 50 per cent motile sperm are generally indicative of a satisfactory male partner. This test is enlightening in that it not only tells us about the motile sperm but also the effect of the female secretions on them. A Huehner test revealing a low sperm count, diminished or absent motility, and a high percentage of abnormal forms would direct us to further study of the male. Rubin quotes Winter as saying that one-third of all sterile marriages are due to the male directly.

4. *Endocrine Study.* The thyroid function should be investigated routinely. A low basal metabolic rate when treated often results in pregnancy. Biological assay of blood and urine for study of ovarian and pituitary hormones, while desirable, is generally impractical at the present time. A colorimetric method would be more practical and of inestimable value. A more simple field of study is the vaginal smear. According to the technic of Geist and Salmon, a small amount of the vaginal secretion is aspirated from the surface of the posterior blade of the speculum with a small glass pipette. The secretion is diluted with a little normal saline, spread on a glass slide, allowed to dry in the air and stained for one minute with fuchsin; the smear is then washed with tap water and is ready for examination. This type of smear is recommended as a simple, reliable procedure for determining the presence of normal ovarian activity or estrogen deficiency, as well as an indicator of the efficacy of administered estrogens in cases of estrogen deficiency.

5. *Tubal Patency.* (a) Rubin test. This term is applied to uterotubal insufflation with air or carbon dioxide. It is usually done a week or ten days after a menstrual period. Rubin has devised an ingenious apparatus with a kymograph and manometer which not only discloses knowledge of tubal patency but also records tubal peristalsis. In normally patent tubes the pressure need go no higher than 100 mm. of mercury. Higher pressures than 200 mm. are not used and tubes are considered non-patent at this point. To determine tubal patency we usually use the Cary tube, an inexpensive and simple apparatus.

(b) If non-patent tubes are discovered, one may resort to uterosalpingography to determine the site of obstruction. Viscous Skiodan developed by Titus and his co-workers is the most satisfactory contrast medium. The additional aid of pelvic pneumoperitoneum has proved in some hands to be of material assistance in visualizing the extent of the damage and in recording the pelvic status.

In cases in which the Huehner test has proved satisfactory and when no contraindication exists, tubal patency tests are routinely made in the office. Stein suggests that frequently both tests may be performed at the same visit, while motile spermatozoa are in the cervix and corpus uteri in the belief that by this means the sperm migration through the tubes may be facilitated.

6. *Endometrial Biopsy.* Suction curettage is the simplest means of obtaining a specimen for study of the

TABLE I.

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Age	33	31	27	31	23	29	34	26	22	25	36	22	27	32	29	28	31
Number of Years of Sterility	2	10	4	8	1	6	3½	3	2	3	3	1	2	2	5	8	3
Previous Term Pregnancies	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0
Previous Abortions	0	1	0	0	0	1	0	0	1	1	0	0	1	0	0	0	0
Cervical Erosions	*					*	*							*			
Tubal Obstruction					*								*				
Salpingitis					*								*				
Hypoplasia									*								
Obesity									*								
Retroversion								*						*			
Fibroids														*			
Amenorrhea									*						*		
Hypomenorrhea							*	*						*			
Hypermenorrhea										*	*					*	
Anatomic Defect										*							
Hypothyroid		*	*				*	*	*			*			*	*	
Husband as Cause						*	*										
Result of Treatment:																	
1. Pregnant now	*	*					*			*	*	*	*		*		
2. Pregnant, then aborted		*	*											*			
3. Normal term pregnancy	*		*	*	*	2		*	*						2		*

endometrium. This procedure may be performed in the office or in the operating room and does not require hospitalization. At the present time endometrial biopsy is the best means of determining whether a patient is ovulating. Since attention has been drawn to instances of anovulatory menstruation, endometrial biopsy has become one of the cardinal steps in a sterility investigation. The patient is instructed to come in a few days before the expected period. The finding of secretory endometrium would indicate corpus luteum influence and, hence, ovulation. On the other hand, a proliferative endometrium would suggest anovulatory bleeding and a probable cause of the sterility.

7. *Determination of the Time of Ovulation.* Several methods are used to determine this in addition to the endometrial biopsy, namely:

(a) Basal body temperatures recorded by taking rectal readings at the same hour each morning.

(b) Study of vaginal smears.

(c) Studies of pregnandiol excretion in the urine as suggested by Venning and Browne. The time of beginning corpus luteum function and, hence, ovulation, may be learned.

(d) The electrical method of Burr and his co-workers at Yale. The latter method is impractical for routine use at the present time. However, the first two methods may be easily used. Rubenstein has patients take rectal temperatures in the morning before arising from bed and at the same time each day; they are also taught to make their own vaginal smears and drop in a jar of fixative to be brought to the physician for weekly study. The changes in temperature and smears depend upon the phases of ovarian activity, in the cycle of hormone production.

Whenever vaginal cornification and depression of the basal body temperature coincide, Rubenstein feels justi-

fied in assuming the existence of a maturing follicle. Whenever there is massive desquamation of vaginal epithelium and a sharp rise in temperature, he diagnoses ovulation. In four patients he found ovulation to occur during the menstrual flow. Intercourse was advised during menstruation, and pregnancy followed in each case.

TREATMENT

If the history reveals possible reasons, such as abnormalities in the menstrual cycle, attempts are made to correct these. Campbell aptly states that the length of the cycle depends upon the complex stimuli between the ovary and the anterior pituitary. If any link in this chain of stimulation is weak, it may well happen that the corpus luteum can not of its own pituitary-controlled vitality sustain the endometrium until the 28th day of the cycle, that is, until the time when the corpus luteum may be reactivated and vitalized by prolactin produced by the developing and implanted embryo. In such cases, the outlook becomes more hopeful if it is found possible to increase the length of the interval. Progestin may prove valuable in lengthening a short cycle and diminishing excessive flow. A patient with amenorrhea may conceivably become pregnant but is not likely to. This condition can frequently be relieved by X-ray stimulation to the pituitary and ovaries after the method of Kaplan of the administration of gonadotropic hormone. Sometimes the two are used in conjunction. Restriction of intercourse to the ovulation period, when this is known, may be effective. Any gross anatomical defects are naturally corrected. Karnaky states that the vaginal flora may be restored to normal with Floraquin. Douches are usually inadvisable although some authorities recommend weak alkaline douches to provide a more favorable medium for the sperm, but this measure would in time invite abnormal flora in the vagina. Cervical erosions are treated and polyps removed. Cary uses repeated

one per cent silver nitrate applications to soften the cervical plug. Fibroids, if they do not prevent conception, may lead to miscarriage; hence, it is generally advisable to remove them as well as ovarian cysts.

In the male, spermatogenesis may be stimulated by anterior pituitary hormones. Prostatic massage may be resorted to.

Many authorities place great faith in the administration of wheat germ oil to supply vitamin E. While this vitamin has been shown to be of definite value in some instances, it is not a cure-all and one should not lose sight of other methods of treatment when indicated.

Low basal metabolic rates are corrected by the administration of thyroid extract or thyroxin. Sometimes it is necessary to use these preparations in conjunction with a gonadotropic hormone to bring up the basal rate. The correction of non-patent tubes is a difficult problem. Plastic surgery on the tubes in the hands of some men has yielded encouraging results, but by and large the best that one can hope for is pregnancy in a small percentage of the cases operated upon. The work of Davis and Koff and Siegler has shown that ovulation can be produced through the administration of the hormone in pregnant mares' serum. The work of these men should open new channels in the treatment of anovulatory menstruation.

A tabulation of the findings in a small series of cases reveals the average age of patients to be 28.5 years. Average duration of sterility is 3.9 years. Two had term pregnancies and five had previous abortions. In considering the results following investigation and treatment, one sees that eight are now pregnant. Three became pregnant, but aborted. The abortions occurred before the third month in every case. Of these three patients, one subsequently had a full term child and another is six months pregnant at the present time. Nine patients have had 11 live births at or near term.

Examination of this data will reveal that there was more than one cause for the infertility in most cases.

CONCLUSION

Some of the more common causes for sterility are mentioned and a plan for sterility investigation is outlined. Tabulation of the results in a small series of cases is given. The fact is stressed that only with a systematic investigation can a fair evaluation be made. One should not waste a patient's time nor her period of possible fertility by giving wheat germ oil or some type of hormone preparation on a purely empirical basis.

The problem of sterility is a complex one and its solution entails systematic study, not merely idle conversation or encouragement to bide one's time—measures which harken back to the days of the nuptial bed racket used by physicians of an earlier century.

With a careful investigation and a competent regime of treatment almost 40 per cent of these patients may become pregnant. Those in whom all efforts fail must find their sole satisfaction in knowing that every possible search for success has been made. These patients will usually find happiness as parents of adopted children.

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Hypertension from the Standpoint of the Otolaryngologist*

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OUR knowledge and our concepts concerning the effects of hypertension on the ear, nose and throat, and more especially those concerning the ear, are very meager and somewhat conjectural. This is in quite a contrast to the well defined changes in the retina which are easily visualized with the ophthalmoscope. However, it is known that almost all of the early symptoms of patients with arterial hypertension are referable to the central nervous system and are an expression of a disordered vasomotor mechanism. The vasomotor disturbance which is responsible for the symptoms may be transitory as in angiospasm or permanent as is found in arteriosclerosis. In this latter group the symptoms are often multiplied due to severe organic visceral damage.

Transitory hypertension due to angiospasm has very few symptoms which are important to the otolaryngologist. In all probability, however, the arterioles of the ear, nose and throat are affected similarly to those of the retina, brain and somatic areas. Angiospasm of vessels which is so clearly seen in the retina in the toxemias of pregnancy and in acute glomerulonephritis is probably also present in the vessels of the brain, ear, nose, throat, and viscera, as well as in the skeletal vessels. Angiospasm of the internal auditory artery and its branches and the arterioles of the cerebral circulation, together with the resultant ischemia and possibly secondary edema, could give rise to symptoms of acute deafness, vertigo, tinnitus, and convulsions. In the majority of cases of mild vasospasm the vessels of the labyrinth are probably not affected enough to cause functional impairment. This same phenomenon occurs in the retina where the vasospasm can be visualized.

Everyone is familiar with the typical picture of acute generalized vasospasm or "collapse" in individuals under emotional or functional strain as in fainting. In acute functional vasospasm or syncope, one is impressed with the generalized pallor of the skin due to vasoconstriction of peripheral vessels; soon this is often followed by sufficient vasoconstriction of cerebral vessels to cause temporary blindness, deafness and loss of consciousness and in some cases convulsions resembling "petit mal." In fear and anger quite often there is a definite generalized vasoconstriction resulting in impaired hearing and visual disturbance of a temporary nature.

Permanent hypertension associated with definite organic sclerosis of arterioles which can be visualized in the retina with the ophthalmoscope and can be demonstrated by biopsy as has been done by Kieth and Wagner, produces certain characteristic symptoms referable to the ear, nose and throat.

Riseman and Weiss¹ from a study of 1,090 cases of pure hypertension without complications, list the following symptomatology:

TABLE I.
Symptomatology of Hypertension. Based on the Records of 1,090 Patients With Elevated Blood Pressure and No Related Disease

Symptom	Number of Cases	Per Cent of 1,090
Headache	473	43.3
Dizziness	440	40.3
Aches and pains	422	38.8
Dyspnea	302	27.8
Nycturia	283	25.9
Nervousness	144	13.2
Palpitation	143	13.1
Tinnitus	129	11.8
Weakness	126	11.6
Insomnia	61	5.6
Epistaxis	61	5.6
Precordial pain	58	5.3
Numbness and tingling	48	4.4
Edema	46	4.2
Spots before the eyes	44	4.0
Hot flashes	24	2.2
Cramps	17	1.6
Nausea or vomiting	13	1.2
Blurred vision	11	1.0
"Angiospasm"	9	0.8
Throbbing	7	0.6
Hemoptysis	6	0.6
Fainting spells	6	0.6
No symptoms	129	11.8

From an analysis of this table, it will be seen that the most frequent symptoms were headache and dizziness. These symptoms were present in over 40 per cent of the cases and, together were present in about 60 per cent of the cases. Thus it will be seen that the otolaryngologist is chiefly concerned from the standpoint of clinical symptomatology. In cases of benign hypertension he is more concerned than the ophthalmologist. In cases of malignant hypertension, the ophthalmological pathology and symptomatology greatly overshadow that found in the ear, nose and throat.

The headaches were both frontal and occipital, more constant and dull in character, rather than throbbing or beating. They were usually not associated with reading or close work. It must be assumed in these cases the headaches were due to cerebral ischemia or edema.

The pathological explanation of dizziness in cases of hypertension is difficult. Alterations in the volume of labyrinthine fluids has been investigated by Mygind and Dederding.² They believe that as a disturbance of water metabolism there develops an edema of the labyrinth. Furstenberg³ believes the dizziness is due to a special avidity of the cells of the labyrinth for sodium rather than an intracellular edema. He advocates a sodium-free diet and large doses of ammonium chloride for therapy. The symptom of dizziness is rarely a true vertigo with nystagmus, but rather a feeling of giddiness or lightheadedness. Caloric and galvanic examination of

*Read before the meeting of the North Dakota State Medical Association, Minot, May 6-8, 1940.

the labyrinth are practically always negative for pathology. The dizziness is more marked on sudden change of position of the head and body. In the absence of other organic pathology, dizziness could be explained on a vascular basis, involvement of either the cerebral or auditory vessels or both.

The changes in the eyegrounds in cases of malignant and benign hypertension have been repeatedly demonstrated both from a clinical and pathological viewpoint. Is there then, an analogy between the hypertensive changes found in the retina and those found in the labyrinth? What pathology, if any, occurs in the labyrinth in cases of acute toxemia of pregnancy or malignant hypertension? Is there such a pathologic entity as "choked labyrinth?" If the vasospasm seen in the retinal arterioles is generalized (and there is every evidence that it is), does this same change occur in the arterioles of the cochlea and vestibular apparatus?

Some interesting work on the subject of "choked labyrinth" has been done by Fischer¹ of Boston. His study was made on patients with increased endocranial pressure from various causes, chief of which was intracranial neoplasm which, however, did not involve the posterior or middle cranial fossa or auditory nerve directly. He was successful in demonstrating a distinct pathological edema of the labyrinth with hemorrhages and transudates resembling the pathology seen in "choked disc." I cannot, however, find in the literature a similar picture of "choked labyrinth" due to vasospasm or organic arteriosclerosis which accounts for many cases of "choked disc" or papilledema or hypertensive neuroretinitis. Fischer believes that this so called "choked labyrinth" can exist for an appreciable period without permanent damage to the labyrinth. Similar pathology in the retina can persist for a variable period, usually without permanent damage to vision. Examples of this are found in toxemia of pregnancy and acute glomerulonephritis.

By far the most constant symptoms referable to the ear in hypertension are those found in so-called benign hypertension. Furstenberg, Maxwell and Alexander presented before the last meeting of the American Academy of Ophthalmology and Otolaryngology a resumé of the symptomatology found in the ear, nose and throat in 156 cases of essential hypertension, two of which were malignant. The most predominant symptom was headache which was present in 50 per cent of cases. In these cases the headaches were aggravated by emotional excitement, nervousness and fatigue. The next most frequent symptom was dizziness. It was present in 30 per cent of the cases. In most patients it was a feeling of unsteadiness or a "swimming in the head" rather than true vertigo.

Impaired hearing was present in 96 per cent of the cases. Both ears showed a striking parallelism in the amount of hearing loss and the tone frequencies involved. No mention is made of the patient's age and the factor of presbycusis. In 37 patients, splanchnicectomy was done and was followed by marked improvement of the hypertension and moderate improvement in hearing. From more recent investigation it has been shown that any

improvement in the symptomatology of essential hypertension following splanchnicectomy depends upon early diagnosis and operation before marked organic changes have occurred in the arterioles. In cases of chronic hypertension with impaired hearing over a long period of time, very little, if any, improvement in hearing should be anticipated.

A histological study of the changes in the inner ear in arteriosclerosis was made in 1931 by Fabinyi² at Johns Hopkins University. His work showed that probably all cases of senile deafness or presbycusis were due to vascular changes accompanying hypertension. About half of his cases had a systolic blood pressure ranging from 165 to 300 mm. Hg. The diastolic pressure was correspondingly increased. The most striking and constant change was definite atrophy of the spiral ganglia and nerve fibers in the basal coil of the cochlea. This change was found in 65 per cent of cases. These changes were accompanied by a corresponding decrease in hearing for the high tones. He was able to show also arteriolar narrowing due to proliferation of the intima and media in 58 per cent of cases. These changes were identical with those found in the retina, kidney and skeletal vessels in hypertension.

It would seem from the investigations reported that permanent vascular pathology similar to that found in the retina, kidney, heart and brain in hypertension is also present in the labyrinthine vessels, and that in all probability there is also an accompanying disuse or secondary atrophy with resultant functional impairment, in this case hearing loss, tinnitus and vertigo.

Acute vascular pathology in the labyrinth consists of vasospasm or vasodilatation with edema, exudation and hemorrhage, probably the best example of the latter is the so-called "choked labyrinth" described by Fischer¹ in cases of intracranial tumors. Another example, according to Portmann⁶ of acute labyrinthine edema and hemorrhage is manifested by "Meniere's Symptom Complex." He believes this symptom complex is caused by a sudden dilatation of the branches of the internal auditory artery causing sudden edema and occasionally hemorrhage. The symptoms of impaired hearing, dizziness and tinnitus have usually a violent onset and are followed by slow recovery. The work of Furstenberg³ would tend to show that the amount of edema may vary and the onset may be more gradual. He believes it is caused by a disturbance of sodium metabolism, rather than simple edema.

The most striking example of labyrinthine angiospasm is Lermoyez's syndrome. It is described as a vasospasm of the internal auditory artery. The hearing impairment is usually more gradual, and after cessation of the spasm, the hearing returns rapidly but is accompanied by vertigo and tinnitus. This syndrome occurs in association with Raynaud's disease.

Shambaugh⁷ has reported a case of spontaneous labyrinthine hemorrhage in a man 70 years old, with hypertension. The patient awoke one morning with deafness in the left ear, nausea, tinnitus, vomiting and ataxia. During the next two months hearing gradually improved,

but never fully recovered. An audiogram showed markedly reduced hearing for high tones and diplacusis, that is, the same sounds were heard as a different pitch in the two ears.

Affection of the nose and throat in hypertension are of little symptomatic importance. The most distressing symptom, of course, is epistaxis. It is apt to be recurrent and very annoying. The bleeding usually comes from the septal branch of the sphenopalatine artery in Kisselbach's area. In a few cases, however, the bleeding vessel is located in the posterior or superior regions of the nose and may be permanently controlled only by ligation of the external or common carotid artery.

In prolonged hypertension with atheroma, a dissecting aneurysm of the aorta may by secondary pressure

give rise to paralysis of the left recurrent laryngeal with resultant voice impairment.

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Thrombosis of Axillary Vein Following Effort

A Case Report

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THIS case merits attention particularly because of its unusual etiology although a total of only some 120 cases has been reported in the literature as reviewed by Theodore Kaplan in 1938. To his article,¹ I refer the reader for further information regarding the clinical entity and the previously reported cases.

The patient, a white male 18 years of age, had always enjoyed excellent health prior to February 13, 1939. Six months before this date the patient had undergone a complete physical examination upon matriculation in the University of Wisconsin and had been given a physical grade of A (which allowed participation in any form of University sport).

On March 3, 1939, the patient consulted the writer in the Out-Patient Clinic of the Department of Student Health, University of Wisconsin, for the first time. On this occasion the patient complained that his entire right arm seemed swollen, felt heavy, and fatigued more readily after exercise than formerly. The patient dated onset to two weeks previous (February 13, 1939) when, while swimming the crawl stroke on the University freshman team, he suddenly suffered a sharp pain in region of angle of right scapula and very shortly afterwards noted a bluish discoloration of right upper extremity. The pain disappeared after a short period of time. Over a period of several hours, the blueness gradually subsided but did not completely disappear. Since that time the patient had noted, in addition to the swelling, heaviness and early fatigue of the extremity, that the superficial blood vessels remained prominent as compared with those of the left extremity, a condition which was not present prior to the sharp pain. The patient had neglected to obtain medical care because he felt well except for the local distress and because of religious beliefs.

Examination when first seen revealed a well developed, well nourished white male 18 years of age whose general physical

condition was excellent. The patient was afebrile. Examination of right upper extremity revealed no evidence of an inflammatory process. The superficial veins of the entire extremity and over the point of the shoulders anteriorly were distended. There was a generalized rubrocyanoosis of the entire extremity which was most apparent in its extreme dependant portion. This cyanosis did not disappear upon elevation of the arm above the level of the shoulder. The skin of the right upper extremity felt taut, dry and slightly warmer than that of the left. There was no pitting edema present. The right radial pulse, as compared with the left, was normal and equal in rate, volume and quality. Blood pressure: 116/76 left arm, 116/74 right arm. No thrombosed vessels nor areas of tenderness could be palpated in the axilla. The axillary lymph nodes were walnut in size, firm, non-tender and bilaterally symmetrical. Measurements of the circumferences of the right arm and forearm in mid-portions were one inch greater than corresponding measurements of the left arm and forearm.

Roentgenographic studies of: (1) the right shoulder area revealed no bony anomaly; (2) the chest revealed no evidence of mediastinal, cardiovascular, pulmonary or pleural pathology; and (3) the cervical portion of spinal column revealed no evidence of cervical rib.

Infra-red photographs confirmed the physical findings of venous obstruction in the entire extremity with collateral circulation established over the point of the shoulder.

Venous pressure readings, circulation time and injection of contrast media were not done.

Since two weeks had elapsed from the time of the injury to the first examination, and since the patient had engaged in subsequent swimming-meets without apparent additional harm, no treatment was deemed advisable other than the use of a sling for the purpose of warning the patient to avoid strenuous use of the extremity. Further swimming, of course, was interdicted.

The patient was seen on six occasions during the following two and one-half months with little if any objective change noted. The patient, however, felt that the arm was considerably improved.

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¹Kaplan, Theodore: Thrombosis of the Axillary Vein, *J.A.M.A.* 110:2059-2064, (June 18) 1938.

Cold Vaccine Study

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Subcutaneous Vaccination

IN the fall of 1939 four batches of mixed bacterial vaccine for respiratory infections were submitted to us for trial by the Cutter Laboratories of Berkeley, California. Two were known to be placebos and two genuine, but only the "Laboratory" knew which were which.

These vaccines were administered hypodermatically to four groups of prison inmates as follows: 1st week, .01 cc.; 2nd week, .25 cc.; 3rd week, .50 cc.; 4th week, .75 cc.; 5th week, 1.00 cc.; and 6th week, 1.50 cc.

In April, 1940, or approximately six months after the treatment was begun, a summary of the results (table I) was made. At the time, it was not known which of the groups received vaccine and which placebos.

The subjects were asked to report any colds subsequent to the treatment. Of the 158 inmates treated, 64 reported no colds up to April 1. The others had "head colds" and 15 had fever over 99 degrees. Twenty-six had two or more "colds" during this period.

TABLE I.
Results of Subcutaneous Vaccination Against Colds

	VACCINE			
	A	B	C	D
Number of Cases	55-100%	26-100%	53-100%	24-100%
No Colds Reported	24-44%	8-31%	21-40%	11-46%
Colds Reported	31-56%	18-69%	32-60%	13-54%
Two or More Colds	6-11%	3-12%	14-26%	3-13%
Temperature over 99°	2-4%	3-12%	7-13%	3-13%
Treatment begun	9-1-39	11-9-39	9-1-39	11-8-39
Treatment completed	10-4-39	12-14-39	10-4-39	12-13-39

The results reported for the several groups did not differ sufficiently to enable us to judge which groups received the vaccine and which were the controls.

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Oral Vaccination

Four other groups of prisoners were given an "Oral Cold Vaccine." Four batches of this were used, two contained vaccine and two were blanks.

These were administered to prison inmates as follows: one capsule daily for the first week and then one capsule each week for 14 weeks.

Table II shows the results of the oral vaccination. Of 174 prisoners treated, 90 reported no colds and 23 reported two or more colds.

TABLE II.
Results of Oral Cold Vaccination

	VACCINE			
	E	F	G	H
Number of Cases	47-100%	47-100%	40-100%	40-100%
No Colds Reported	22-47%	16-34%	28-70%	24-60%
Colds Reported	25-53%	31-66%	12-30%	16-40%
Two or More Colds	8-17%	13-28%	0-0%	2-5%
Temperature over 99°	5-11%	6-13%	2-5%	2-5%
Treatment begun	9-1-39	8-26-39	12-27-39	12-14-39
Treatment completed	12-7-39	12-1-39	4-2-40	3-21-40

From the tables it is obvious that the results of the oral administration of vaccine do not differ materially from the injections. The reader may draw his own conclusions as to the effectiveness of the treatments with the aid of the following key, which was sometime later supplied by the Cutter Laboratories:

A and B were mixed bacterial respiratory vaccines, for subcutaneous use.

C and D were placebos for injection consisting of a dilute aluminum hydroxide suspension.

E and H were Oral Vaccine.

F and G were the placebos consisting of starch filled capsules.

The Care of the Acute Sinus*

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THE patient with an acute sinusitis may seek relief in an immediate operative procedure or in palliative treatment. In either event, he presents a serious case. The primary infection is usually in the nasal cavity and the involvement of the sinus is secondary. This should be kept in mind when it comes to treatment. Another factor to consider is whether the condition is an exacerbation of an old chronic inflammation. This is the type that comes to surgical operation most frequently and the pathological picture will be quite different from that found in the primarily acute case.

The severely acute sinus is usually a unilateral affair. It occurs most frequently in the anterior group of sinuses, the frontal ethmoidal, and the maxillary sinuses. The latter is involved most often, the frontal rather rarely. As a rule the rhinologist does not see these cases early. If of the fulminant type, operative measures are at once to be considered. In less severe cases palliative treatment may be attempted. The main question then will be to determine the proper handling of the case, and will be answered by clinical experience with the symptoms presented, supported by such findings as radiologists and the laboratory can supply. Pathological changes take place rapidly. The bacterial flora likewise changes from day to day. The Pfeiffer bacilli may be present early, but later supplanted by the pneumococcus, which again will be supplanted by other bacterial types.

It is the purpose here briefly to consider the most frequent acute sinus cases encountered, namely the anterior nasal group. Of these the most serious in regard to complications and treatment is the acute flare-up in the frontal sinus. This is the result of its anatomical position, being contiguous to the brain and because of the difficulty in surgical and medical approach. If the attack is fulminant in nature relief must be instituted more or less immediately. The less severely affected may permit trying some milder measures. The procedures which are considered safe to perform to facilitate drainage from the frontal sinus are: first, the breaking aside of the anterior end of the middle turbinate, and then removing obstructive tissues or polyps that may be found within the hiatus semilunaris, as well as removing hypertrophy or polypoid tissue in the region of the bulla-ethmoidalis. Enlargement of the frontal duct is not considered safe.

Too often the frontal sinus does not conform with the anatomically normal. It should always be studied with the aid of the roentgenologist for the presence of obstructing septa or abnormally placed ethmoid cells. It is known from clinical experience that a virulent infection will soon fatally cripple the normal function of the lining membrane and at best a chronic frontal sinus-

itis will result. The possibility of extension to the neighboring brain tissue is always present. Exploration through an external opening is the only safe course. After all this is a life-saving measure and an external scar is not too great a price to pay to avoid the chronic frontal sinus which usually follows the temporizing method.

Of the anterior group the maxillary sinus is most often involved, but involvement is usually secondary to the primary infection in the ethmoid, frontal, or occasionally from dental caries. It may prove to be a very painful affection but not likely to involve important contiguous structures. Drainage is comparatively easy, not very painful and can be accomplished without interference with functioning nasal tissues. Palliative and non-surgical methods may be tried. The primary cause usually is in the upper nasal regions, so the rational treatment will require that this field receive equal attention, if not the principal concern. Rest in bed, nasal shrinking medication, and, when available, the proper type of short wave diathermy.

In the medical treatment of acute nasal infections there is a wide difference of opinion, if not unnecessary confusion. A recent writer advised using that particular method of treatment that has proved effective, and the technic of which is easily mastered.

Most of the medications commonly in use and various other drugs are used in tamponage. Some drugs are inhibitive to ciliary function. These are contraindicated. Tamponage with 10 per cent ichthyol in glycerine is the outstanding choice. It is used by alternating with other drugs. The comparisons seem overwhelming for ichthyol. The only reason ichthyol tamponage is not generally used is that little has been said about it. Also, it has a disagreeable odor and is messy. In glycerine it is a powerful hygroscopic, something the silver derivatives are not. It leaves no undesirable after effects. For me the use of ephedrin is unsatisfactory. The shrinkage effect is often too temporary, and in some cases the subsequent congestion follows too quickly. The art of tamponage must be practiced with painstaking care. The patient is ill with a painful affliction. Mentally, he is far from normal, and often the treatment must be administered without conveniences, as for instance at the bedside.

As in the case of the frontal sinus, a rapidly degenerating process in the antrum must be aborted. This often requires early drainage. And, as before mentioned, this presents no great difficulty. Some prefer irrigating through the natural opening which is at the upper apex. This does not seem to be the practical way. It is said by well qualified anatomists that only 50 per cent can be so cannulized, the other attempts being forced entrances through the membranous wall which is found just behind the natural ostia. Be that as it may, an

*Read at the meeting of the Sioux Valley Eye and Ear Academy, Sioux City, Iowa, January 17, 1940.

easy entrance can be made in the middle third of the mesial wall into the lower nasal fossa. This provides a constant drainage as long as required, something no other method furnishes. Furthermore, the lower fossa opening gives more information diagnostically, furnishes aeration required and can be made permanently patent in case of chronicity—all of which are desirable. That making a small opening through the thin mesial wall is too dangerous is a view not to be taken seriously. This operation is performed in the office frequently both for diagnostic and drainage purposes.

After providing ample drainage, the acute condition in the antrum usually subsides. Since the primary trouble is usually in the ethmoids, the main effort is directed toward a cure for upper nasal infection. Regardless of the surgery done, a daily ichthyol pack is introduced and the short wave diathermy is used. That the general condition has been treated is of course assumed. Strict confinement to bed is always advised.

Regarding nasal packs, they are chiefly useful in the acute cases. One is seeking relief for nasal tissue congestion and inflammation, and also relief from pain. This is the place where tamponage finds its usefulness. For proper effectiveness, the technic of proper packing must be carried out. The patient's coöperation is first acquired, and the nasal cavity is desensitized and shrunk. The saturated pack is then carefully inserted in contact with all parts of the upper nasal region and left there for a period of 15 to 20 minutes. When the pack is removed the nose is sprayed with an oily solution. Almost invariably the patient expresses a feeling of relief, saying the "stopped-up" feeling is gone.

The acute ethmoid presents itself as a severe "head cold." Morning headache is the predominant complaint. These cases may come to the office or one may be called to attend them at their bedside. It is estimated that there are 300 million colds in this nation annually. How many of these are going to be serious and deep-seated chronic cases, and become the primary source of infection for serious involvement of the neighboring sinuses? This problem is important because of the patient's particular climate. Unfortunately, these cases are not seen in the early stages. The rhinologist is often consulted

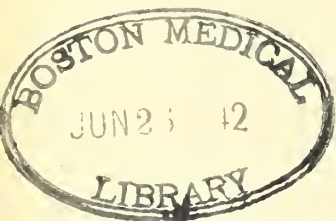
when the condition is already seriously acute. Infiltration and engorgement of the ethmoid structure is severe. Excruciating pain is the chief complaint, and it is difficult to relieve. These symptoms, however, will subside under care, but all too often the contiguous sinuses, frontal, sphenoid and maxillary, will become involved.

In acute ethmoiditis, there is often severe congestion and polyposis blocking the frontal duct and otherwise obstructing drainage of the sinuses lying above. The maxillary sinus situated just below may become the reservoir of infectious discharge. While the frontal sinus usually escapes involvement, the maxillary does not. The ethmoid is a multicellular structure. The acute condition may subside and all symptoms apparently disappear, yet this structure will still harbor a latent infection. That this type of case is overlooked in the after-care is a just criticism of this specialty. Surgical drainage of the ethmoid structure is a simple procedure, and subscribes to every principle of conservative practice, yet this is much neglected.

Surgery in severely acute anterior ethmoiditis is not often called for. Extension to the other frontal orbit or brain is rare. On the other hand, empyema of the posterior ethmoids is more apt to involve the brain or orbit, especially should it occur in the young.

After subsidence of the acute condition proper aeration and drainage of the anterior ethmoid group can be done without much difficulty. When clearing the semilunar space for this purpose some prefer to preserve the anterior middle turbinate. They break the latter aside and proceed through the bulla-ethmoidalis extending the operation until the desired clearance of the involved cells is accomplished.

Retained pus, whether in blind ethmoid cells, antrum or any sinus should be searched for and drainage provided. As a rule, general blood stream infection from sinus infections is rare, yet long retained pus in the sinus structure is not a pleasant condition and should be eradicated. Aggressive measures may seem radical, but whether it is a life-saving effort or just the preservation of functioning organs, it is simply good surgical practice and in every way it is conservative.



Recent Advances in Intravenous Fluid Therapy*

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THE intravenous use of fluids has increased greatly in the past ten to twenty years. However, it is not an entirely modern therapeutic procedure. The first experimental intravenous injection of drugs was performed by Christopher Wren, of architectural fame, in 1656. Using a quill to which a small bladder was attached, Wren injected opium and crocus metallorum into two dogs, the first injection stupefying the dogs and the second, as Wren graphically phrased it, "causing them to vomit up life and all." It is questionable as to who was the first to attempt the intravenous injection of drugs into a human subject, but Wren again was apparently the first, for in 1662 he injected venum emeticum into a disobedient servant until the subject fainted. In the same year Major successfully performed injection on a man, but no details of this procedure were given. By the latter part of the Seventeenth Century numerous other investigators were performing intravenous injection, using a great variety of medications. Because of various accidents occurring in connection with the giving of intravenous infusions, the practice had fallen into disrepute by the beginning of the Eighteenth Century. In 1800, there was renewed interest in the subject, and from 1802 to 1822, there actually was a periodical in existence which was devoted solely to intravenous injection and transfusion. A Dr. Hale of Boston was undoubtedly the boldest investigator of this period, because he reported the injection of a half ounce (about 15 cc.) of castor oil into himself intravenously. He wrote a detailed account of his very unpleasant experiences, and naturally concluded by taking a stand against intravenous injection as a therapeutic measure. In 1831, a Scotch physician, Latta, introduced the practice of administering intravenous saline infusions to patients in a state of severe collapse from Asiatic cholera. This procedure was suggested to him by chemists who had found that the blood of patients suffering from malignant cholera was deficient in water and saline material. Thus, more than a hundred years ago, began the rational intravenous treatment of dehydration. In the last quarter of the Nineteenth Century, the intravenous injection of saline solutions had come into use but not generally so. However, the intravenous administration of fluids did not come into general use until the advent of the World War. Bayliss, Cannon, Dale and Keith probably contributed the most of workers of that time in their efforts to find a suitable fluid for intravenous purposes in the combating of shock during the war. After the war, the intravenous administration of fluids became generally widespread.

MODERN CONCEPTION AND OBJECTIVES OF INTRAVENOUS FLUID THERAPY

Although there is no doubt that the development of

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satisfactory and safe intravenous methods has been one of the significant advances of modern medicine, it has not been entirely an unmixed blessing. The amount of fluid to be administered, the type of fluid to be used, and the rate of injection all have been the subject of controversy. Cutter,¹ in a study of the products of a commercial laboratory making fluids for intravenous purposes, demonstrated the wide variation in the types of fluids used in various sections of the country. As an example of this, he found that 5 per cent dextrose in a physiologic solution of sodium chloride was used four times as frequently in the Northeast as in the Southwest, and in the Northwest, three times as frequently as in the Southwest.

Intravenous therapy has four main objectives: first, the replacement of fluids, such as is necessary in dehydration; second, to increase the caloric intake such as is necessary in the postoperative treatment of patients who are unable to take anything by mouth; third, the restoration of various physiologic chemical processes to normal, as in the replenishment of the body chlorides in patients who have a loss in chlorides resulting from prolonged and excessive vomiting, and fourth, the production of dehydration by means of the introduction of hypertonic solutions, as is done in administering hypertonic solutions to reduce intracranial pressure.

PHYSIOLOGIC ASPECTS OF FLUIDS

Before considering the various indications for the intravenous use of fluids, and the type and amount of fluid suited to each patient, I should like to consider the physiologic aspects of fluids generally. In any consideration of intake of fluid, the amount of fluid drunk by the individual is of course of first importance. However, this intake accounts for only one-half the fluids acquired by the body, the food supplying the rest. Water in the food is derived from two sources; first, the actual content of water in food itself, which on a normal maintenance diet contains 1000 to 1500 cc. of water, and second, the water which is formed as a result of the oxidation of protein, fat and carbohydrates.

Loss of water from the body occurs by four mechanisms: it is excreted as urine by the kidneys, it is lost through the bowel in the stools, it is lost through the skin by sweating and evaporation, and it is lost through the lungs by the exhalation of water vapor (table 1).

The water lost via the skin and lungs varies greatly with the temperature and relative humidity of the atmosphere, and with the extent of muscular exercise indulged in by the individual. In hot climates, the loss of water through the skin and lungs may be 3000 cc. daily, and in very torrid atmospheres it may be as much as 10,000 cc. Thus, the thermal regulatory mechanism of the body by the process of vaporization utilizes whatever amount of water is necessary, and in contrast, the renal function

TABLE I.
Daily Loss of Water for Average Sized Man

Skin (at average temperature and humidity)	450 cc.
Expired air (at average temperature and humidity)	300 cc.
Urine	1500 cc.
Feces	150 cc.
Total	2400 cc.

diminishes or ceases when the water supply is low, because the kidney functions with whatever amount of water remains after other demands have been supplied. The fluids which are lost through the feces normally account for not more than 150 cc. daily and such losses are, therefore, usually negligible except in the presence of severe diarrhea.

DEHYDRATION

Dehydration, the most important indication for the use of fluids, can be brought about in numerous ways.

First, it may occur through simple deprivation of fluids, for under these circumstances water continues to be lost from the body through excretion in the urine and sweat, even though the amount lost in this manner is somewhat reduced. In the presence of fever, the loss of water is even greater than it is in simple deprivation of fluids.

Second, dehydration may be occasioned by excessive loss of water such as occurs in the presence of persistent vomiting, prolonged diarrhea, or in excretion of large quantities of urine or sweat, especially when such a loss is accompanied by a restricted intake of water.

Third, dehydration may be occasioned by reduction in the total quantity of electrolytes present in the body fluids. The electrolytic concentration of the body fluids, both extracellular and intracellular, is maintained constant through the retention or elimination of water. As an example, when high intestinal obstruction occurs, large quantities of gastric juice containing chlorides are secreted and vomited, entailing a loss of chloride from the blood. Normal concentrations of electrolytes in the blood and tissue fluids are maintained by the retention of carbon dioxide, and as a consequence of this retention there is an increase in bicarbonate. The compensation for the loss of chloride leads, however, to alkalosis, which is then countered by an increased excretion of base in the urine, which is in turn accompanied by diuresis, leading to dehydration.

Fourth, dehydration may be caused by the injection of hypertonic solutions into the blood stream, a procedure which causes a temporary increase in the osmotic pressure of the blood with a resultant flow of fluid from the tissues into the vascular system until equilibrium is established. The blood volume is thus temporarily increased, but is soon returned to normal by the loss of the excess fluid via the kidneys.

Dehydration affects the body in many ways. There is a loss of weight caused by the reduction in tissue water as well as to the actual breakdown of body substance which occurs to provide water for the maintenance of normal body fluid. Disturbance of the acid

base balance takes place, the disturbance usually causing acidosis. This occurs chiefly because of the slowing of renal circulation, with consequent reduced excretion of urine and the retention of acids, especially phosphoric acids. There is an increase in the nonprotein nitrogen of the blood. There is elevation of the body temperature as a result of the reduction in the circulating fluid. Normally when dehydration is present, the individual has a sensation of thirst caused by suppression of secretion of the salivary glands. A loss of water from the deeper layers of the skin results in dryness and wrinkling of the skin.

PHYSIOLOGIC SOLUTIONS OF SODIUM CHLORIDE

The first type of fluid used intravenously, and one which probably is still the most commonly used, is a physiologic solution of sodium chloride, either alone or in combination with dextrose. Physiologic solutions of sodium chloride contain 8.5 gm. of sodium chloride per 1000 cc. The normal daily intake of sodium chloride is 6 to 10 gm. In other words, if 4000 cc. of physiologic salt solution were administered in twenty-four hours, the patient would receive 34 gm. of salt, or three to five times the normal daily intake of this. Prolonged administration of excessive amounts of salt may result in renal damage, or at least would favor the retention of excessive amounts of salt in the tissues with edema resulting from the retention of fluid, which is brought about by increasing the hydrostatic pressure within the circulatory system and decreasing the osmotic pressure within the circulatory system by diluting the colloids. In the case of the average surgical patient, the intravenous injection of fluid is carried out for not more than two or three days, so that the development of edema is rarely observed in these patients. However, if the patient is one whose convalescence is slow and who has received daily injections of physiologic salt solution, edema is not infrequently observed. It must be remembered that if edema is present, it will be seen not in the legs, but in the dependent parts of the body such as the region over the back. It has been shown that patients who received 5 per cent dextrose in physiologic salt solution gain weight as a result of retained fluids, whereas fluid is not retained in patients receiving 5 per cent dextrose in water. In patients in whom edema develops as a result of excessive administration of salt solution, solutions of dextrose were found to be very effective in the elimination of retained fluids. Apparently, the development of a small amount of edema for short periods is not harmful to the patient. However, severe and prolonged edema interferes with cardiac function and favors the development of pulmonary edema.

On the other hand, there are certain illnesses in which salt is specifically indicated, such as high intestinal obstruction or any other illness that will cause prolonged vomiting, such as Addison's disease, heat exhaustion, and the condition resulting from prolonged induced fever therapy. At first, when the physician is dealing with dehydration, salt is beneficial because it aids in the retention of fluids in the body.

SOLUTIONS OF DEXTROSE

Solutions of 5 or 10 per cent dextrose are used at present almost as much as salt solutions, and as time goes on will probably be used more and more. This is well substantiated by figures from the laboratories at the Mayo Clinic. In 1934, 24,000 liters of salt solution were used as compared to 9000 liters of dextrose solutions; in 1935, 24,000 liters of salt solution were used compared to 19,000 liters of dextrose solution, and in 1936, which was the last year in which solutions were made at the clinic, and thus, the last year in which accurate data are available, 21,000 liters of salt solution compared to 22,000 liters of dextrose solution were used. As these figures show, it is believed, more and more, that a solution of 5 or 10 per cent dextrose in water is the fluid of choice in the absence of any specific indications for the administration of sodium chloride. As has been mentioned, one of the advantages of the solutions of dextrose is their food value, 1000 cc. of a solution of 10 per cent dextrose providing 400 calories. In a patient who is taking little or no food by mouth, the glycogen content is rapidly diminished and the fat, which then becomes the main source of energy, is incompletely oxidized with resultant ketosis. In replenishing the glycogen content by dextrose administered intravenously, ketosis is prevented. Despite the advantages of glucose, it must be remembered that metabolic balance cannot be maintained by the intravenous administration of solutions of dextrose, salt or by any other intravenous solutions, so that patients must have food by mouth at the earliest possible time.

Hypertonic solutions of dextrose, such as solutions of 20 or 25 per cent dextrose, or even 50 per cent dextrose, are used only when specifically indicated, as in the mobilization of edema, or in the presence of anuria or oliguria.

ALKALINE SOLUTIONS

To discuss the mechanism of acid-base equilibrium would take us too far afield. Suffice it to say, that in various illnesses there is a disturbance in this equilibrium and that this disturbance may be corrected by the intravenous use of various solutions. Alkalosis does not occur commonly, yet occasionally it is encountered following prolonged use of alkaline powders in the treatment of peptic ulcer. This is frequently seen in those cases in which renal damage is present. Acidosis is seen more commonly than alkalosis and is usually the result of either renal insufficiency or neglected diabetes. Another type of acidosis that is being seen with increasing frequency is the acidosis resulting from the administration of large doses of sulfanilamide. The solution that is used most frequently in combating acidosis is a solution of 5 per cent sodium bicarbonate given intravenously. One injection of 300 to 500 cc. of a solution of 5 per cent sodium bicarbonate is given. That sodium bicarbonate administered intravenously must be given with caution is well illustrated by table II.

REPORT OF CASES

Case 1. A man, aged 84 years, had experienced symptoms of increasing urinary obstruction for three years. Finally, he was entirely unable to void and it was necessary that the bladder be catheterized. He had been vomiting frequently. On admission to the hospital, January 5, he was extremely dehydrated, very weak and stuporous. The prostate gland was greatly enlarged, the enlargement being caused by benign hyperplasia. The patient was given 2000 cc. of physiologic salt solution intravenously immediately on admission after an inlying urethral catheter had been inserted. Physiologic salt solution was used in this instance because it was assumed that since the patient had been vomiting, the concentration of blood chlorides might be reduced. This subsequently was found not to be true. A study of the carbon dioxide content of the blood showed the presence of definite acidosis. This was combated by the intravenous administration of 500 cc. of a solution of 5 per cent sodium bicarbonate. Because the acidosis was moderately severe, it was considered that a second injection would be necessary. This was carried out before results of the studies of the blood chemistry were known, and as a result alkalosis was produced, as indicated by the fact that the carbon dioxide combining power was 80.6 volumes per 100 cc. of plasma.

Although this patient did not suffer ill effects and did improve daily, the case demonstrates the necessity for caution and the importance of frequent studies of the blood chemistry when sodium bicarbonate is given intravenously. In general, not more than one injection of the solution should be given without studying the carbon dioxide combining power of the blood.

The use of a solution of 5 per cent sodium bicarbonate intravenously in combating acidosis caused by sulfanilamide therapy, in an instance in which it was necessary to continue the administration of sulfanilamide, is well shown by table III.

Case 2. A woman, aged 58 years, had had chronic suppurative otitis media. During an exacerbation of this condition meningitis developed, the patient exhibiting all the classical signs of the latter condition. The cerebrospinal fluid contained 1,585 cells. Type III pneumococcus was recovered from the cerebrospinal fluid. Sulfanilamide was administered in two forms: a solution of 0.8 per cent of sulfanilamide subcutaneously and sulfanilamide orally.

The patient began to suffer from acidosis after receiving large doses of sulfanilamide, and it was necessary on three occasions to administer a solution of 5 per cent sodium bicarbonate intravenously as shown in table 3. By this means the acidosis was kept under control so that sulfanilamide therapy could be continued.

Another solution used in combating acidosis is molar lactate or Hartmann's solution. This contains sodium lactate which after being metabolized is converted into sodium bicarbonate. In our experience at the clinic, molar lactate solution acts much more slowly than sodium bicarbonate in combating acidosis, and since in the presence of acidosis the physician usually wishes a prompt result, the solution of 5 per cent sodium bicarbonate is more commonly used.

SOLUTIONS OF ACACIA

A solution that is not used so much now as formerly, because of improved methods in transfusions of blood, is solution of acacia. However, in specific instances, this solution is of definite value and still fills a definite place in the armamentarium of intravenous fluids. The solution used is 6 per cent acacia in a solution of 0.9 per cent sodium chloride. The original use of solution of acacia was for patients suffering from shock. As has been shown, solutions of dextrose or physiologic salt

TABLE II.
Blood Findings and Intravenous Medication, in a Case of Urinary Obstruction, Showing Effect of Administering Sodium Bicarbonate Intravenously (Case 1)

January	6	7	8	9	10	11	12	13	14	15
Urea, mg. per 100 cc.	174		90				48			48
Creatinine, mg. per 100 cc.	2.2		1.5							
Chloride, mg. per 100 cc.	651		600							558
Carbon dioxide combining power, volumes per 100 cc.	21.1		57.9	80.6			66.4			55.1
INTRAVENOUS MEDICATION										
Physiologic saline solution, cc.	2000							2000	2000	1000
5 per cent glucose in distilled water, cc.		1000	1000	1000	1000	1000	1000			1000
5 per cent sodium bicarbonate, cc.		500	500							

TABLE III.
Treatment with Sulfanilamide in a Case of Otitis Media and Suppurative Meningitis Caused by Pneumococcus, Type III

Date 1939	Sulfanilamide		Carbon Dioxide Combining Power of Plasma, Volumes Per Cent	Sodium Bicarbonate	
	Quantity given in 0.8 per cent solution and orally			Given Orally, Grains	Given Intravenously in 5 Per Cent Solution, cc.
	Grains	cc.			
May 29	60	500			
30	60	500			
31	144	1200	10.4	24.9	300
June 1	96	800		35.3	
2	80		10.8	32.4	200
3	115		11.3	40.0	60
5	90		10.4	37.2	50
6	90		9.1	42.8	60
7					50
8	75				30
9	110		12.3	46.0	30

solutions are not so effective for shock inasmuch as they leave the circulation rapidly. Solution of acacia because of its colloidal osmotic pressure, tends to remain in the circulation longer than the two aforementioned solutions and for that reason is more effective than anything except a transfusion of blood. Acacia has a definite place of value in the treatment of the milder degrees of shock or as a temporary measure until blood can be obtained. Another less well-known indication for the use of acacia is chronic nephritis in which a marked nephrotic element and hypoproteinemia with severe edema are present. In the presence of such a condition, solution of acacia is of value in producing diuresis. For some reason, not known, there is frequently a very prolonged effect remaining after administration of solution of acacia, although the acacia itself does not remain in the body

in appreciable amounts for any length of time. The amount usually administered is 600 cc., and it is given two to four times on alternate days. Although cases have been reported in which renal or hepatic damage has resulted, from the use of acacia, in our experience at the clinic we have not found this to be true.

INDICATIONS FOR INTRAVENOUS INJECTION OF FLUIDS

The indications for administration of intravenous fluids may be grouped broadly into two classifications, surgical and medical. Considerable overlapping occurs in such a broad classification, but such a category serves for convenience. In the surgical group of indications, undoubtedly the most important indication is postoperative dehydration. There has been much work done on

the loss of fluids occurring during and immediately after surgical procedures. Collier and Maddock² probably have done as much work as any investigators on this subject. They have shown that the amount of fluid required by the patient who has undergone a surgical operation and who has an uncomplicated postoperative course is as follows: (1) water for vaporization, 1500 cc. and, (2) water for the formation of urine, 1000 cc. If there is an abnormal loss of fluid such as might be caused by vomiting, the administration of additional fluid is necessary. For the patient who is suffering from sepsis or who has fever, additional fluid will be required: (1) water for vaporization, 2000 cc., and (2) water for formation of urine, 1500 cc. It is easily understood why the patient has a need for fluid during his postoperative course when it is considered that on the day of operation the intake of food and fluid is restricted, but, on the other hand, there are losses of fluid from the body. The operating room is warm and the patient is carefully wrapped and perspires profusely during and after the operation. There is also a loss of fluid as a result of loss of blood. Collier³ and his associates reported the results of a study of loss of fluid in a group of eighteen patients undergoing general surgical operations. The total loss of fluid caused by loss of blood, vomiting, formation of urine and vaporization amounted to an average of 1 liter per patient. In postoperative dehydration, there is no physiologic indication for the administration of any specific fluid, and the fluids most commonly used are 5 per cent dextrose in normal saline solution, 5 per cent dextrose in water, or normal saline solution alone. The only advantage in utilizing dextrose is its caloric value and the only disadvantage in utilizing saline solution is that if it is used for several days it will lead to the development of edema, as has been already mentioned.

In the presence of intestinal obstruction there is a decided loss of chlorides as a result of the loss of gastric juices resulting from prolonged vomiting. Accompanying a decrease in the plasma chlorides are a decrease in renal function and development of alkalosis. The treatment for this condition is the intravenous administration of saline solutions.

Azotemia secondary to so-called surgical diseases of the kidney such as hypertrophy of the prostate gland with urinary obstruction, or unilateral or bilateral ureteral obstruction as caused by calculi or tumor, is frequently encountered. As has been shown by Haben,⁴ patients who have these conditions often may have a value for blood urea as high as 200 to 300 mg. per 100 cc. and yet not have true uremia, in that they rarely have convulsions and there is very little if any elevation in blood pressure. However, as a result of azotemia, these patients frequently have severe nausea and vomiting, which result in dehydration which also contributes to the already impaired renal function. The first step in treatment in these cases is to relieve the obstruction, such as would be achieved by the use of an inlying urethral catheter in the presence of prostatic obstruction. Almost as important, is the administration of large

amounts of fluids, not only to relieve the dehydration, but to rid the body of the retained metabolites.

Since many of the aforementioned patients cannot take sufficient fluids orally because of nausea, fluids must be given intravenously. As has been mentioned, acidosis which is secondary to renal insufficiency can be combated by the intravenous administration of a solution of sodium bicarbonate or Hartmann's solution. In the presence of oliguria or anuria, which is not infrequently encountered in so-called surgical diseases of the kidney, hypertonic solution of 10 per cent sodium chloride may be very effective in re-establishing a satisfactory urinary output. Similarly, solutions of 20 per cent, 25 per cent, or even 50 per cent dextrose in distilled water are frequently effective in producing diuresis. Another solution that is sometimes effective in the treatment of oliguria or anuria is a solution of sodium sulfate, 42 gm. in 1000 cc. of distilled water.

Diets rich in carbohydrate and intravenous injections of solutions of dextrose are well-known adjuncts in the preoperative and postoperative management of patients suffering from disease of the biliary tract. Obstructive jaundice is followed rapidly by progressive injury to the hepatic cells, an injury which interferes with the storage and manufacture of glycogen. The same is true when cirrhosis of the liver is present. It is believed by some physicians that the intravenous administration of solution of dextrose is associated with a greater concentration of glycogen in the liver than is the case when carbohydrate is taken by mouth by the patient.

Another use for solutions injected intravenously has been found in solutions of dextrose of varying concentrations as an aid in the management of patients suffering from myocardial damage secondary to coronary sclerosis and in instances of myocardial infarction. Dyspnea, especially the paroxysmal, nocturnal type, is in many instances greatly relieved by the daily intravenous injection of 300 to 500 cc. of a solution of 10 or 20 per cent dextrose. As in instances of hepatic disease, the intravenous use of solutions of dextrose apparently replenishes the glycogen content of the heart more effectively than does dextrose administered by mouth, and this probably accounts for its beneficial effect. When edema is present, the amounts injected should be somewhat smaller than otherwise, but because of the diuretic effect of concentrated solutions of dextrose the mobilization of edema may be thereby aided.

When heat exhaustion is present, it is well known that one of the contributing factors is the loss of chlorides, and for patients who are in a state of profound prostration the intravenous injection of solutions of sodium chloride may be a lifesaving measure. A similar condition, brought on by induced fever therapy, also can be controlled effectively by the intravenous use of solutions of sodium chloride.

Certain practical considerations are involved in the intravenous use of fluids. The rate of injection is a problem which demands consideration. The cardiovascular system under normal circumstances compensates very readily for the additional load placed on it by the

intravenous injection of fluids. The fluids diffuse into the tissue or are eliminated rapidly, so that an increase in volume of the blood is only slight and temporary. Usually, 50 to 75 drops per minute can be well tolerated by the patient. Sometimes, in the presence of myocardial damage, the intravenous injection of fluids will cause substernal pain or a sensation of pressure in the thorax and dyspnea. The rate of injection should then be reduced below the rate at which symptoms are produced, or else the injection should be discontinued. Sometimes, one or two hours are necessary for the injection of 1 liter of fluid.

Solutions of dextrose injected intravenously, especially those of high concentration, will cause venous thrombosis, an important consideration when frequent injections are necessary over a long period. This condition may be obviated, in many instances, by administering, after injection of a solution of dextrose, a few cubic centimeters of a physiologic solution of sodium chloride.

At times venipuncture is difficult because of the small veins encountered. This difficulty may be overcome to a great extent by covering the arm, wrist and hand, with a hot moist pack thirty minutes before the injection is made.

SUMMARY AND CONCLUSIONS

1. The physiologic aspects of body fluids reveal that they are normally derived from the fluid drunk and from

the food consumed, and that fluids are lost from the body by way of the urine, the stools and vaporization.

2. Solutions of sodium chloride are specifically indicated in cases in which prolonged and excessive vomiting is present, in the crisis of Addison's disease, in heat exhaustion, in prolonged induced fever therapy, and in dehydration. The use of solutions of sodium chloride is contraindicated over any prolonged period because of their tendency to cause retention of fluid in the body tissues with consequent edema.

3. The use of solutions of dextrose has become increasingly popular because of the caloric value of such solutions and the fact that they do not tend to cause retention of fluids within the body tissues.

4. A solution of sodium bicarbonate is of definite value in the treatment of acidosis.

5. Solution of acacia is used when mild forms of shock are present, and in chronic glomerulonephritis with hypoproteinemia.

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The Use of Bacteriophage in Treatment of Furunculosis in Students

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FURUNCULOSIS in students is a frequent ailment. Adolescents and young adults are commonly afflicted with acne and skin infections. This is especially true in athletes and students. Many times training for athletic events or preparation for examinations is interrupted by a recurrence or a "crop" of boils.

These boils may be only painful and inconvenient, or they may be quite dangerous as are those situated about the nose, upper part of the face and upper lip. Usually such infections start with a single lesion, but frequently a series of several occurs before the unfortunate sufferer returns to normal.

Many reasons have been advanced for the causation of boils. The increased activity of the skin glands at this age, the development of the hair follicles and sebaceous glands, disturbances of endocrine secretions, faulty elimination, improper care of the skin, faulty diet (excessive amount of sweets, fats, condiments), deranged sugar metabolism—all these are possible factors, but

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definite proof of any single cause is lacking. It would seem that the actual cause is a combination of lowered resistance of the skin and the introduction of virulent bacteria in sufficient numbers.

Many methods of management of these infections have been advocated such as the use of hot fomentations, tin oxide, incision, excision, vaccine, etc.¹ It seems to us that treatment of this disturbance is incomplete without greater consideration of the use of bacteriophage and for that reason this brief discussion is presented.

Our experience with a number of students in the professional schools of the University of Illinois may be of interest. We have found a distinct seasonal occurrence—it is most prevalent in the spring of the year. Friction of clothing along the collar line, sleeves, and buttocks seems to favor inoculation of the skin. Trauma such as picking the nose, plucking of hair, and squeezing of comedones may initiate the lesion. The well nourished and obese are slightly more prone to this affliction.

In most of our cases, localization of the infection had occurred at the time the patient presented. When the

furuncle was in an early stage and the inflammation still diffuse with no opening into the lesion, hot fomentations were applied continuously until "pointing" had occurred. The hot fomentations consisted of large wet sterile gauze dressings wrung out in hot water and covered with parchment paper and held in place with adhesive strips. These were changed about every hour or two. When the lesion had sufficiently localized, the center of it was usually covered with a thin skin, and was opened by merely lifting off this desquamated tissue. The opening into the lesion need be only very small. Cruciate incision or "lancing" was not done. An attempt was made to carefully pass a small wick drain consisting of a few threads of plain gauze into the sinus leading into the lesion, and continuous wet dressings saturated with bacteriophage were applied. If there is no communication from the surface into the lesion, the dressings of bacteriophage seemed ineffective. Injections of bacteriophage around or into the boil were not attempted as it was thought that such procedure would be too much of a risk. Also there is skepticism concerning the therapeutic results reported from the injection of bacteriophage.^{2,3}

The bacteriophage dressing was covered with parchment paper and held in place with adhesive tape strips. If the patient was up and about, the lower edge of the parchment paper was held to the skin by one wide strip of adhesive while the upper margin was left open. Then bacteriophage was dropped on the dressing through the open upper edge in sufficient amount to saturate the dressing. More was added from time to time to keep it moist.

In the case of intranasal infections a loose cotton dressing soaked with the bacteriophage was inserted into the nasal passage in such a manner as to lie in contact with the infected area. Additional bacteriophage was added with a medicine dropper at frequent intervals to keep the cotton dressing saturated. Of course no pressure or instrumentation of any kind was used in these nasal infections.

It should be emphasized that the manner in which the phage is used is very important, and the technique is based upon direct contact of the phage with the infected tissues.⁴ Plain gauze and cotton dressings were used because antiseptics hinder the action of phage.⁵

Our bacteriophage was one prepared by standard methods, using fresh virulent "polyvalent" cultures of *Staphylococcus aureus* recently isolated from boils and "M23" bacteriophage. Thus, there may ordinarily be six to ten strains which are combined and lysed and filtered.⁶ The phage was prepared at frequent intervals so that there was always a fresh supply. It was always kept in a refrigerator and used only if clear, being discarded if any cloudiness or sediment developed.

This method of managing these infections was all ambulatory so that the students missed no time from classes.

In our series of over two hundred cases covering a period of five years, the results were uniformly gratifying. There was a striking relief from pain very soon

after the application of the phage. In six to twelve hours the site of the lesion appeared much smaller and tension and tenderness were much diminished. Thick purulent exudate was changed into a clearer serous drainage. Healthy granulations were soon evident. Movement of the affected part was more comfortable and the manipulation of changing dressings was without pain. The course of the infection was shortened and convalescence rapid. These results coincide with those obtained by other workers.^{7,8}

This method of management is particularly applicable to the intranasal type of infection. Every practitioner is familiar with examples of fatal complications resulting from these lesions. We have had one such fatality in a student who had the lesion treated surgically but not by the bacteriophage. These intranasal furuncles present a type of infection that is always looked upon with trepidation and with a feeling of helplessness because so little active treatment can be used (except X-ray therapy), and because manipulation and instrumentation are usually contra-indicated. This management gives us a more effective method of active therapy from which we may expect prompt improvement and in which we have learned to place a high degree of confidence.

SUMMARY

The advantages of this treatment of furunculosis in students may be summed up as follows: The treatment is ambulatory and thus there is no loss of time from classes or work. There is rapid improvement and resolution of the infection. There is a lack of recurrences or "crops" of satellite boils. The technique is not unpleasant to the patient and secures early relief of pain. It is easy of application because there is no heating or changing of dressings required. Last but not least the treatment with bacteriophage in intranasal, facial, and upper lip infections is effective where other methods of treatment are unsatisfactory.

CONCLUSIONS

The use of bacteriophage has proved to be a valuable addition to the treatment of furunculosis and deserves special consideration in lesions about the nose, face, and upper lip.

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J. WEIR MITCHELL SCENTED DISEASE

A patient comes to the physician primarily because of some ailment. He seeks relief from the symptoms that he proceeds to describe in detail and with such clarity as he may have at his command. Intelligent treatment cannot be instituted until the identity of the disorder has been determined. Diagnosis, therefore, is the problem of first importance. It is arrived at through careful examination, correlation of findings, and deductive reasoning. The case history is often a great help, but scientific medicine is not satisfied to base a final pronouncement upon that alone. Even if the story be true, its significance must be determined by means of recognized methods of observation and tests.

Frequently, the criticism is heard that the younger physicians resort so quickly to laboratory methods that they are prone to lose the acuity of perception based upon the special senses that the profession of a former

generation was dependent upon. That does not mean that the advent of new instruments of diagnostic precision should be deplored but rather that the ancient art of using the faculties of sight, smell, hearing, and tactile sense should precede laboratory tests in making a satisfactory diagnosis. One of the special senses that has not been highly developed in physical examinations is that of smell. Textbooks and lectures rarely refer to it. In delving into the subject of diagnosis, Osler assigned the topic of smell to a senior student, a Mr. Cole of Fergus Falls, Minnesota, who dug up some interesting information, among which was a letter from J. Weir Mitchell. He related how by smell alone he had made a diagnosis of smallpox one dark night in an unlighted cross-town bus in Paris. He felt so sure about it that he required the driver to come to a standstill under a street lamp and asked the passengers to come out of the vehicle. Upon examination of each, he discovered

one who exhibited pustules characteristic of the disease, thus confirming the diagnosis.

A. E. H.

BEING OF SERVICE

Physicians experienced in human nature know that the business man often values the opinion of a medical man on topics even outside the field of medicine if that opinion has proved respectable in previous contacts. The man of general affairs knows that the doctor's training develops honest, straight-thinking application to whatever the problem in hand and his calling imposes standards that insure respect.

But it is equally well known that in changing times, when the medical profession is coming under scrutiny

by various groups, the physician is wary of going outside his field. Guide-posts of ethics have been set up and restrictions have been made stronger and more enforceable than ever.

Thus the doctor need have no hesitancy in refusing a request for a testimonial or endorsement, be it political or commercial, beyond the realm of his practice and custom. The wise doctor will explain this and the acquaintance or group that makes the request will understand the situation and respect his sincerity and the fact that he is constantly striving to improve his worth to his community rather than to see his name in print or oblige a friend with comment that later may arise to haunt.

T. Z.

Book Reviews

Surgical Anatomy of the Head and Neck, by JOHN F. BARNHILL, M.D., F.A.C.S., LL.D., Emeritus Professor of Surgery of the Head and Neck, Indiana University School of Medicine; 761 pages with index and illustrations; Baltimore: Williams & Wilkins Company: 1940. Price \$15.00.

Doctor BARNHILL, the "Hoosier schoolmaster" of head and neck surgery, after an experience of 50 years in teaching and operating above the collar-bone, brought out the first edition of his *Surgical Anatomy of the Head and Neck* three years ago. He had worked diligently and long, convinced that there was a crying need for an all-inclusive surgical presentation of this area such as no other book contained, having always maintained that an oto-rhino-laryngologist should know all about the head and neck. The author claimed that no one was an oto-laryngologist who called on a general surgeon to ligate the jugular vein, or carotid artery, or do a thyroidectomy. Never satisfied with less than perfection, after the appearance of the first edition, the author set about revising it, rearranging it, and presenting more drawings, a great many of which are original not only in their conception but by having been drawn personally by Dr. BARNHILL, who is an octogenarian. Some may take exception to the old terminology rather than the B.N.A., but the book is practical from cover to cover and records the long life-time experiences of a past master in head and neck surgery. This contribution will stand as a monument for years to come before improvement can be made on it. Its point of view represents a concept that will stimulate younger men to go forward just as the author has been stimulating graduate classes for decades. Operative steps and technic are complete and detailed instructions are given. It is highly recommended not only for students, but for eye, ear, nose, and throat specialists and as a real reference book in its field.

The book has been adopted for the use of students of anatomy in their preparation for passing the American Board of oto-laryngology. It will be read with interest and profit for anyone seeking to broaden his knowledge in this field. It is a work distinguished from all others because of its unique approach and illustrations, and certainly one anatomy of the head and neck which can and should be read from cover to cover by everyone professing to practice in that area. It is not just another book but a distinctly new volume in the field of head and neck anatomy, a keen, sparkling presentation of facts. It illustrates that progress in anatomy has not yet reached its end. The index is thorough and complete. The World War conflict will more and more demand competence in this field and the reader will appreciate the necessity of possessing the great store of knowledge presented, which illustrates the author's prodigious experience in teaching and in the practice of medicine with his

ever-searching eye for the truth. There is no padding and the writing is clear and direct as well as perfectly organized. One cannot say this second edition was to bring the book up-to-date but was to improve the presentation of the material considered. One can felicitate the author on the monument which he has erected to himself.

The Neuroses in War, by several authors under the editorship of EMANUEL MILLER, M.A. (Cantab), M.R.C.P., D.P.M. (Cams), with a concluding chapter by H. CRICHTON-MILLER, M.D., F.R.C.P.; 250 pages; New York: The Macmillan Company: 1940. Price \$2.50.

War has always been waged as much upon peoples' emotions as against their bodies. But not until the present "war of nerves" have these intangible factors been so publicized. The several authors who have collaborated with the MILLERS present essentially a preview of the nervous morbidity to be expected in this war. Practically every chapter was written before the "Battle of Britain" and most of the factual material is taken from World War I. Such information is directly applicable to military psychiatry. But the past wars throw little light upon the mental aspects of civilian bombing. The rebuttal of this criticism is anticipated on the cover jacket, "Since human nature has not changed, these conclusions are as valid as ever, while the need for such a study is infinitely greater." British plans for coping with the civilian problem are discussed in detail. There is an excellent discussion of shell shock in the appendices.

Applied Pharmacology, by HUGO A. MCGUIGAN, Ph.D., M.D., F.A.C.P., Professor of Pharmacology and Therapeutics, College of Medicine, University of Illinois; 914 pages; St. Louis: C. V. Mosby Company: 1940.

Dr. MCGUIGAN neatly disarms his critical readers at the outset by quoting in the preface a couplet of Pope's:

"Whoever thinks a faultless piece to see,
Thinks what ne'er was, nor is, nor e'er shall be."

No one will accuse MCGUIGAN of writing the perfect textbook of pharmacology. The work is intended as a text for medical undergraduates and for their use it adequately covers the field. Practitioners of medicine will be disappointed in the lack of explicit therapeutic directions. Much attention is given to pathological physiology in relation to pharmacology and toxicology. The outline of the book like most similar texts, follows drug classifications. Therapy of disease entities is considered under the heading of the drugs used for the condition. Dr. MCGUIGAN has a tendency toward pedantry reviving forgotten bits of therapeutic history and inserting unenlightening etymologic notes in parentheses as "Thirst (A.S. Thyrst)". Illustrations are few but of excellent quality. There are several beautiful full page diagrams in color illustrating autonomic innervation.

Gynecological and Obstetrical Pathology with Clinical and Endocrine Relations, by EMIL NOVAK, A.B., M.D., D.Sc., (Hon. Dublin) F.A.C.S., Associate in Gynecology, Johns Hopkins Medical School; 496 pages with 427 illustrations; Philadelphia: W. B. Saunders Company: 1940.

A profusion of clear-cut well executed illustrations of nearly every condition described in the text makes this practically an atlas of obstetric and gynecologic pathology. The classical order "from without in" is followed considering first diseases of the vulva and successively the vagina, cervix and corpus uteri, the tubes, and ovaries. The chapters on new growths of the ovary are excellent, though occupying, perhaps, a disproportionate amount of space. Toxemia of pregnancy is not discussed and many purely obstetric conditions are given but brief mention. Dr. NOVAK stresses morbid anatomy of gynecology rather than pathologic physiology of pregnancy. He has the faculty of lucid easy description. He has written an excellent text of gynecologic pathology.

Medico-Legal Ophthalmology, by ALBERT C. SNELL, M.D., lecturer in Ophthalmology, University of Rochester School of Medicine and Dentistry, Consultant in Ophthalmology in various hospitals; 312 pages; St. Louis: C. V. Mosby Company: 1940.

This monograph is the first of its kind in the English language. It epitomizes the information that might be required of an ophthalmologist appearing as an expert on the witness stand. The main portion of the book deals with liability and compensation cases. There is an excellent chapter on malingering explaining in detail the ingenious tests devised to expose simulation of blindness or loss of visual acuity.

The book is addressed to a small audience of ophthalmologists but undoubtedly will be in demand for reference by any medical expert witness preparing to testify concerning loss of vision. The work will be of interest to members of boards examining men drafted for military service.

Taber's Cyclopedic Medical Dictionary, by CLARENCE WILBUR TABER and Associates; 1500 pages with 273 illustrations; Philadelphia: F. A. Davis Company: 1940.

This ambitious work is an outgrowth of *Taber's Digest of Medical Terms* of 1937 and the later *Taber's Medical Dictionary*. It is something more than an abridged medical dictionary and certainly something less than the standard works of Dorland, Stedman and Gould. It is a textbook of nursing procedure, a manual of dietetics, a first-aid book for the home and office, and incidentally a dictionary. Under "Pneumonia", for instance, is listed etiology, symptoms, nursing procedures, prognosis and treatment, and for good measure an illustration of the temperature sheet of a lobar pneumonia with a crisis on the traditional seventh day. Most people consult a dictionary to find out the meaning of a word, not for the treatment of a disease. The actual definitions lack conciseness and are occasionally erroneous. The work cannot be considered authoritative. It is recommended neither for physicians nor medical students.

Synopsis of Materia Medica, Toxicology and Pharmacology, by F. R. DAVISON, M.Sc., Ph.D., M.B., Assistant Professor of Pharmacology, School of Medicine, University of Arkansas; 8 vo., 663 pages; St. Louis: C. V. Mosby Company: 1940.

As the title indicates this book is a compendium of pharmacology with special emphasis upon materia medica. The essential features of most of the important drugs used in medicine are given. The book is smaller than standard texts on the subject, eliminating mainly the physiological and other experimental evidence included in the larger volumes. The discussion of blood transfusions seems out of place and out of date. Few modern therapeutists will agree with DAVISON'S admonition that blood transfusions are contraindicated in bleeding peptic ulcer. Recent important drug legislation is not mentioned. Sulfathiazole and sulfamethylthiazol are given a line each. The chief virtue of this work of DAVISON is its conciseness and accessibility for quick reference.

Health Is Wealth, by Dr. PAUL DEKRUIF; 246 pages; New York: Harcourt, Brace & Co. Price \$2.00.

"Health is wealth" or "it costs less" to save 'em than to bury 'em" is the theme of PAUL DEKRUIF'S latest book. In this book he deals with medical economics. It consists of a series of eight articles, six of which have been previously published in the *Country Gentleman*. Briefly it is a story passionately told, sometimes with rancor, of the author's unsuccessful attempts to persuade the present administration to adopt his platform for a national health program.

DEKRUIF'S National Health Program has five titles or "fundamental principles": (1) The Federal Government shall provide financial and technical aid to the various states in their programs of preventive medicine where those states can show need. (2) The Federal Government shall provide financial aid for the medically indigent; this part of the program to be worked out by the medical profession and the lay public in each state; the relation of patient and the physician not to be disturbed; programs to be based on the prepayment, non-profit, group medical care plan. (3) The Federal Government shall give financial aid for both voluntary and federal hospitals and health centres wherever such need is demonstrated. (4) The Federal Government shall provide aid for medical education and research. (5) There shall be Federal Aid for public health and medical accounting.

In an elaboration of the above principles DEKRUIF emphasizes the following points: (1) That the Federal Government should function only as banker and should have nothing to do with the administration nor the control of the program. (2) That no money should be made available for any form of Compulsory Insurance.

Teaching Wholesome Living, by ALMA A. DOBBS, M.A., Board of Education, Los Angeles, Cal.; 304 pages; New York City: A. S. Barnes & Company. Price \$2.50.

It is now generally acknowledged in the educational world that health is an all important factor in preparing children for best citizenship. Health not in the sense of absence from disease but rather in the sense of "Total Wholesome Living." ALMA DOBBS in *Teaching Wholesome Living* has written a splendidly unique and original book around this concept, both for children and teachers. The book is a revision of the course of study in "Wholesome Living" used in the Los Angeles City Schools since 1923. She has not only developed a philosophy but she has put into the curriculum a practical scheme by which concrete and authentic facts are taught the child to increase his opportunity to "grow in all ways." Her idea of "Wholeness" is not entirely new. It depends upon the fundamental law of life, the "unitary nature of the universe." She believes that the only way that the children can attain this "wholeness" is through an education which is concerned with the growth and development of "all the potentialities for mental, social, spiritual, and physical harmony."

The book is divided into three parts. The first part deals with a general discussion of the author's point of view. The second part offers a concrete practical course in training for "Wholesome Living" for the pupil. Here the specific "emphases" to be absorbed by the child himself are classified according to his grade. What the pupil in each year should know and experience; from watching his height and weight to balancing his own daily menu. Four hundred sixty-four of such specific facts and experiences are recorded in outline form to help the individual pupil in carrying on his life activities. Part 3 is an elaboration of these 464 pupil life activities. Each activity in which the pupil of elementary school age receives his training is briefly discussed. These activities are interwoven with the general learning situations within the school. They are taught in correlation with the pupil's daily routine. The appendix is devoted to three separate chapters on alcohol and other narcotics, health knowledge tests and sex education.

Proceedings of the
Twenty-first Annual Meeting
of the
AMERICAN STUDENT HEALTH ASSOCIATION

University of Michigan, Ann Arbor, Michigan

December 27-28, 1940

Business Session

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FRIDAY, DECEMBER 27, 1940

Morning Session

9:30 Registration—Lobby, Health Service Building.

10:00 General Session, Amphitheater, Rackham Building.
Call to order by President—Dr. Ruth E. Boynton, University of Minnesota.
Welcome—Dr. Warren E. Forsythe, University of Michigan.
Paper: The Health Responsibilities and Contributions of the School Physician to Physical Education—Dr. John Sundwall, University of Michigan.
Paper: Obesity in Relation to Diet—Dr. L. H. Newburgh, University of Michigan.
Paper: Relation of Carbohydrate to Dental Caries Activity—Dr. Phillip Jay, University of Michigan.
Paper: Some National Defense Problems of Universities and Colleges—Dr. T. A. Storey, American Social Hygiene Association.

12:30 Association Luncheon, Michigan League.
Address by President—Dr. Ruth E. Boynton, University of Minnesota.
Report by Secretary-Treasurer—Dr. Ralph I. Canuteson, University of Kansas.
Appointment of Nominating Committee.
Reports of Chairmen of Standing Committees (5 minutes each).
Health Service, Dr. J. Wilbur Armstrong, Berea College.
Organization and Administration, Dr. William B. Brown, Stephens College.
Informational Hygiene, Dr. C. E. Shepard, Stanford University.
Hygiene of Physical Activities, Prof. Wm. LaPorte, University of Southern California.
Health Problems of College Women, Dr. Glendine Snow, Michigan State Normal College.
Tuberculosis, Dr. C. E. Lyght, Carleton College.
Local Sections, Dr. Dean F. Smiley, Cornell University.
Eye Health, Dr. R. W. Bradshaw, Oberlin College.
Mental Hygiene, Dr. T. Raphael, University of Michigan.
Training Personnel, Dr. W. E. Forsythe, University of Michigan.
Revision of Constitution.

Afternoon Session

2:30 Round Table Sessions, Rackham Building.
Committee on Health Service, Amphitheater.
Chairman: Dr. J. Wilbur Armstrong, Berea College.
Topic: Hearing Impairment in College Students.
Discussion Leaders: Dr. Horace Newhart, and Dr. J. P. Ritenour, Dr. Irvin W. Sander, Dr. George T. Blydenburgh, Dr. J. G. Grant, Dr. Grace Hiller.
Sound Film: Methods of Testing Hearing.
Committee on Informational Hygiene, Assembly Hall.
Chairman: Dr. Charles E. Shepard, Stanford University.
Topic: Evaluation of College Health Instruction: Instructors and Materials.
Discussion Leaders: Professor C. E. Turner, Dr. Ruby Cunningham, Dr. A. G. Gould, Dr. Grace M. Kahrs, Dr. K. Frances Scott, Dr. Amelia Wood.

4:00 Tour of University of Michigan Health Service Building.

4:00 Council Meeting—Conference Room, Health Service Building.

5:00 Tea—Statistical Laboratory, Health Service Building.
* * *

7:00 Banquet—Michigan League.
Presiding—Dr. John Sundwall, University of Michigan.
History of Student Health Work—Dr. J. E. Raycroft, Princeton University.
The Interdepartmental Social Hygiene Board and the President's Committee of Fifty, Dr. Thomas E. Storey, Stanford University.
Entertainment Feature.

SATURDAY, DECEMBER 28, 1940

Morning Session

9:00 Round Table Sessions—Rackham Building.
Committee on Organization and Administration—Amphitheater.
Chairman: Dr. William B. Brown, Stephens College.
Topic: Group Hospital Insurance for Students.
Discussion Leaders: Dr. W. G. Donald, Dr. L. R. Cole, Dr. Jane North Baldwin, Dr. W. H. York, Mr. Clinton McDonald, Dr. R. R. Summers.
Committee on Health Problems of College Women, Assembly Hall.
Chairman: Dr. Glendine Snow, Michigan State Normal College.
Topic: The Relation of the Student Health Service to Preparation for Life after College.
Discussion Leaders: Dr. Jane North Baldwin, Dr. Amelia Wood, Dr. Helen Pryor.

10:30 Committee on Hygiene of Physical Activities, Amphitheater.
Chairman: Prof. Wm. LaPorte, University of Southern California.
Topic: Essential Steps in Coordinating the School Health and Physical Education Programs.
Discussion Leaders: Dr. Margaret Bell, Dr. Helen Pryor, Dr. Dan G. Stine, Dr. Lee Milford, Dr. John Wilce.
Committee on Eye Health—Assembly Hall.
Chairman: Dr. R. W. Bradshaw, Oberlin College.
Topic: Eye Health.
Discussion Leader: Dr. J. H. Kler, Rutgers University.

- 12:30 Tuberculosis Committee Luncheon—Michigan League. Presiding—Dr. C. E. Lyght, Carleton College. Report of Tuberculosis Committee. Applicability of Collapse Therapy to Tuberculosis in Students—Dr. John Alexander, Professor of Surgery, University of Michigan.

12:30 Council Luncheon—Michigan League.

Afternoon Session

- 2:00 General Session, Amphitheater, Rackham Building. Business Meeting. Report of Council Meeting. Report of Nominating Committee. Paper: Complaint and Situation, Dr. L. E. Himler and Dr. T. Raphael, University of Michigan. Paper: What Does the Public Know About Health, Dr. Mayhew Derryberry, National Institute of Health. Paper: Functional Lighting in the College, Prof. J. O. Kraehenbuehl, University of Illinois. Paper: Appendicitis: A Hazard of the Young Adult—Dr. Dorothea Scoville, Connecticut College for Women.

BUSINESS MEETING

Friday, December 27, 1940

Report of the Secretary-Treasurer

The following report of the Council Meeting of December 29, 1939, was read and approved:

"The following members of the Council were present: Dr. Charles E. Shepard, president, presiding; Dr. W. H. York, vice-president; Dr. Ruth E. Boynton, secretary-treasurer; Dr. R. W. Bradshaw; Dr. Joseph E. Raycroft; Dr. Thomas E. Storey; Dr. Warren E. Forsythe; Dr. Dean F. Smiley; Dr. E. Lee Shrader; Dr. Lee H. Ferguson; Dr. Ruth M. Collings; Dr. H. N. Kingsford and Dr. Robert E. Legge, guest; Dr. J. P. Ritenour, new member of the Council, and Dr. Ralph I. Canuteson, new secretary-treasurer.

Dr. Shepard introduced the first order of business: place for the 1940 meeting, and suggested that Ann Arbor, Michigan, be considered in honor of Dr. Forsythe's twenty-five years of health service activity.

The secretary read invitations from Cleveland and Washington.

Dr. J. P. Ritenour suggested a change of date for the annual meeting and after general discussion of meeting with the American Medical Association, in the early fall or in the spring, it was agreed that the present arrangement is the best possible.

Dr. W. H. York moved that the next annual meeting be held at Ann Arbor, Michigan, during the Christmas holiday. Second by Dr. Lee H. Ferguson. Carried.

Dr. Shepard suggested that a special effort be exerted to attract the founders of the American Student Health Association to the next meeting and that special invitations be sent them.

It was agreed that Friday and Saturday, December 27 and 28, 1940, would be the dates.

Dr. Shepard suggested that a committee be appointed to study the constitution and by-laws of the organization to see if they were satisfactory in their present form.

Dr. Ferguson moved, and York seconded that the president be empowered to appoint such a committee. Carried.

Dr. Storey suggested that publications in the JOURNAL-LANCET be checked carefully in order to accredit to them the proper writer, address and title. It was suggested also that the various committees submit for publication in the spring tentative programs for the next meeting, and that the final program appear early in the fall. This was conceded to be a worthy aim.

Dr. Shepard introduced the item of financial aid to take care of expenses for secretarial work both for the association secretary and for committee chairmen. Storey suggested that the executive committee pass on all expenses incurred by such committees and authorize payment of reasonable bills. Raycroft suggested that each committee and the secretary turn in a budget of estimated expenditures for the following year. Ferguson moved and Collings seconded that the executive committee be

empowered to authorize payment of whatever expenses are necessary in carrying out the work of the secretary and of the various committees. Motion carried.

Drs. Storey and Forsythe discussed the advisability of centering the program next year around what teacher-training schools can do to emphasize the part of teacher-training institutions in health education.

It was suggested that the following council discuss the matter of a program committee to correlate various committee work.

Dr. Raycroft suggested that discussors be appointed for each paper and round table for next year.

Meeting adjourned 2:00 p. m."

The treasurer's report was read and approved.

RALPH I. CANUTESON, M.D.,
Secretary-Treasurer.

FINANCIAL STATEMENT

December 27, 1940

Receipts

Balance brought forward:		
Check from Dr. Boynton	.....	\$1,224.08
On deposit in Minneapolis	.....	1,000.00
Dues for 1940 from 162		
member institutions *	.....	1,620.00
Dues for 1941 for 2 prospective		
members	.....	20.00
Proceedings sold: 8 at \$1.75	.....	14.00
		\$3,878.08

Disbursements

Secretary's Office:		
Postage	.....	\$ 39.36
Telegrams	.....	3.17
Stationery	.....	31.95
Exchange on checks	.....	.96
Secretarial help	.....	50.00
Miscellaneous (repair filing case,		
transfer files, pins, check stamp)	.....	11.39
		\$136.83
Subscriptions to		
JOURNAL-LANCET (182)	.....	\$273.00
7 additional subscriptions		
(new members)	.....	10.50
Publishing 1939 Proceedings		
(450 copies)	.....	429.60
500 labels	.....	3.50
450 boxes	.....	45.00
Postage	.....	13.37
		774.97

Membership in American Council of Education 10.00

Refunds to sections:		
Pacific Coast (7)	.....	\$ 17.50
Rocky Mountain (7)	.....	17.50
Southwestern (6)	.....	15.00
South Central (12)	.....	30.00
North Central (15)	.....	37.50
Michigan (5)	.....	12.50
Indiana (5)	.....	12.50
Ohio (15)	.....	37.50
Mid-Atlantic (17)	.....	42.50
Southern (8)	.....	20.00
New York (20)	.....	50.00
Pennsylvania and New Jersey (19)	.....	46.50
Mississippi Valley (7)	.....	17.50
New England (27) no refund		
made to date	.....
Illinois (5) no refund made		
to date	.....
		356.50

*14 member institutions paid 1940 dues in 1939.

Committee Expenses:

Informational Hygiene:	
Dr. Wood, 1939	\$ 6.38
Dr. Shepard, 1940	9.00
Tuberculosis, Dr. Lyght	16.60
Health Service, Dr. Armstrong	15.55

47.53

Convention Expenses:

Programs, 570 special anniversary programs with mailing envelopes for 250	\$ 79.23
Council Luncheon (13)	10.04
Printing tickets for luncheons and banquet	6.70
Reprints, Dr. Hitchcock's article	25.25
Movie film and projector	19.50
Travel expense, Dr. Newhart	35.00
Travel expense, Secretary-Treasurer	58.18

233.90

1,559.73

Balance \$2,318.35

RALPH I. CANUTESON, M.D.,
Secretary-Treasurer.

REPORT OF NOMINATING COMMITTEE

December 27, 1940

The nominating committee, composed of Dr. R. W. Bradshaw, chairman, Dr. Dean F. Smiley and Dr. C. E. Lyght, presented the following ballot for officers of the Association for 1941:

- President: Dr. Ruth E. Boynton, University of Minnesota, Minneapolis, Minnesota.
- Vice-President: Dr. A. G. Gould, Cornell University, Ithaca, New York.
- Secretary-Treasurer: Dr. Ralph I. Canuteson, University of Kansas, Lawrence, Kansas.
- Members of the Council for two years, terms expiring December, 1942:
- Dr. George T. Blydenburgh, Ohio Wesleyan University, Delaware, Ohio.
- Dr. Grace Hiller, Goucher College, Baltimore, Maryland.
- Dr. H. D. Lees, University of Pennsylvania, Philadelphia, Pennsylvania.

The report of the nominating committee was accepted and the secretary instructed to cast an unanimous ballot for these officers.

BUSINESS SESSION

Saturday, December 28, 1940

The Secretary-Treasurer presented the following report of the Executive Council meeting December 27, 1940.

"Members of the Council present were: Dr. Ruth E. Boynton, presiding; Dr. Warren E. Forsythe, Dr. Joseph E. Raycroft, Dr. J. P. Ritenour, Dr. Charles E. Shepard, Dr. R. W. Bradshaw, Dr. H. N. Kingsford, Dr. W. H. York, Dr. Dan G. Stine, Dr. Ralph I. Canuteson.

Applications for membership in the American Student Health Association for the following institutions were presented and given final approval:

Antioch College, Yellow Springs, Ohio, Dr. P. B. Wingfield.

Brooklyn College, Brooklyn, N. Y., Miss Sallie Kutz. New York University College of Medicine, New York City, Dr. Charles A. R. Connor.

North East Missouri State Teachers College, Kirksville, Mo., Dr. A. F. Miller.

Sarah Lawrence College, Bronxville, N. Y., Miss Edna Morehouse.

State Teachers College, Bemidji, Minn., Miss Amy Erickson.

Stout Institute, Menomonie, Wis., Dr. Julius Blom.

Wilson College, Chambersburg, Pa., Dr. Agnes Lyon Scott.

State Teachers College, Superior, Wis., Dr. R. E. Christianson.

The withdrawal from the Association was accepted for: University of Houston, Houston, Texas. Nazareth College, Nazareth, Michigan.

Central State Teachers College, Mt. Pleasant, Michigan, was re-instated.

It was agreed that new members approved after July 1 were to receive without charge the JOURNAL-LANCET for the remainder of the year only (no back copies) and membership dues were to be applied to the next year.

The verbal agreement between the JOURNAL-LANCET and the American Student Health Association designating the JOURNAL-LANCET as the official journal of the Association expires with the end of the current year. A letter from Mr. L. M. Cohen of the JOURNAL-LANCET was read offering renewal of the agreement and after some discussion Raycroft moved, and Shepard seconded, to renew our affiliation with the JOURNAL-LANCET. Motion carried.

Dr. Raycroft presented a proposal from Dr. Storey relative to the stand of the American Student Health Association on the problem of health and national defense. The proposal was referred to a subcommittee (Dr. Shepard) for editing and presentation at the next business meeting December 28, 1941.

The secretary offered as a suggestion an annual questionnaire card to be sent out when the secretary sends statements of annual dues, this questionnaire to be a source of information on health service activities of the member institutions. After considerable discussion the matter was referred to the Committee on Organization and Administration with a recommendation that the plan be tried.

Approval was given for expenses incurred by committee chairmen for postage, secretarial help and mimeographing necessary in preparing their parts of the annual program.

Council adjourned at 5:00 p. m."

The report was approved as read.

By a rising vote the assembled members of the Association expressed their appreciation for the hospitality of Dr. Warren E. Forsythe and the University of Michigan.

The President announced that the 1941 meeting would be held in New York City and the dates of the meeting would be decided later.

RALPH I. CANUTESON, M.D.,
Secretary-Treasurer.

Societies

TRANSACTIONS OF THE MINNEAPOLIS CLINICAL CLUB

Stated Meeting

Thursday, November 14, 1940

The President, Lawrence R. Boies, M.D., in the Chair

(The paper: "Diethylstilbestrol, Review of Literature," read by Dr. Charles H. McKenzie at this meeting, will be published later.)

A STUDY OF THE BLIND

(Inaugural Paper)

CHARLES E. STANFORD, M.D.*

In a recent number of an ophthalmic journal is an article titled "After Half a Century of Cataract Extraction." The writer recorded the observation of a lifetime in practice, observations which to him seemed significant. He stated that the management of cataract may represent a life-long problem; that "imperative, therefore, is a studied diagnosis and prognosis preceding operation, lest details which later cause complications and even prevent success be neglected."

Those of us who have not yet acquired this lifetime experience may gain a certain amount of prognostic insight by studies of the causes and course of eye conditions which have, in some cases, ended in blindness. The one question uppermost in the mind of every person with a serious eye condition is "Will my eyesight last?" In every single eye condition coming to our attention, the one thought which should be pre-eminent is: What can be done to insure that this person's useful eye-span will equal his life-span?

According to Kerby, "the incidence of blindness among children under 5 years is about two in ten thousand. The rate falls off during pre-school, school, and adolescent ages, but again reaches two at about the age of 35. It increases up to the age of 60, when it is about nine in ten thousand, and very rapidly thereafter until it reaches a very high rate of seventy-five in ten thousand at the age of 80 or over."

In 1935, Berens, Kerby and McKay compiled data from the various schools for the blind throughout the United States. They found that in the preceding school year (1933-34) 1,382 or 51.1 per cent of the 2,702 children enrolled were blind because of congenital or hereditary eye defects.

In 1936 a similar study was made in Minnesota, a study of the causes of blindness among new students at the State School over the ten-year period just preceding. One hundred eighty-five (52.4 per cent) of the children had congenital or hereditary eye defects.

In July, 1940, of 961 adult recipients of state aid as blind persons, 228, or 23.7 per cent, were listed as blind due to these causes.

The more common entities in the group are albinism, aniridia, ectopia lentis, congenital cataract, congenital myopia, congenital glaucoma, and retinitis pigmentosa. Case and statistical studies of the blind from these causes help to answer such questions as: What is the prognosis for a child born with one of the serious eye conditions for (1) securing better vision, (2) maintaining vision at a useful level, or (3) total loss of vision?

It is not possible to cover the entire list of congenital and hereditary eye conditions. Four only—albinism, glaucoma, cataract, and retinitis pigmentosa—will be discussed.

The ocular manifestations of albinism are pink or red pupils, translucent iridis, nystagmus, intolerance of light and defective vision. While visual acuity is always very poor, there is no reduction in the normal perception of color and light. Albinism is hereditary. The character acts as a Mendelian recessive. The frequency with which it occurs is estimated at about one in 10,000 births. On that basis, Minnesota has about 250,

*Consultant ophthalmologist, Minnesota Bureau for Aid to the Blind.

more or less. Yet during a ten-year period, only eight albinos were admitted to the State School for the Blind and there are only nine on the state blind aid rolls at present. The majority of albinos have shown their ability to acquire an education and to maintain economic independence in spite of defective vision. Accustomed to from 10 to 20 per cent of normal vision from birth, nearly all acquire ability to read print down to 10-point type by holding the print from 4 to 6 inches from the eye.

There is no evidence to show that the albinotic eye is more vulnerable to disease or prone to degeneration in later life than a normally pigmented eye. In fact, there is some evidence that such eyes do improve slightly with age. The prognosis for the albino is, therefore, good for maintaining vision at a level of 10 to 20 per cent of normal. With proper selection of an occupation based upon his visual capabilities, the average albino need not be a recipient of aid as a blind person.

Retinitis pigmentosa, often called progressive night blindness, is characterized by degeneration of the rod-and-cone elements in the retina, a gradual loss of visual field and ultimately of central vision. The condition is usually inherited as a recessive. Consanguineous marriages are, therefore, not uncommon among the parents of those affected. Often termed an abiotrophy, the condition usually is discovered in childhood or early adult years. Whether it is ever present at birth is doubtful.

In Berens' study, 81 children (3 per cent) had retinitis pigmentosa. At our state school there were 19 admissions for it in ten years. On the state rolls at present are 69 persons so affected, 7.1 per cent of the total. A positive family history was recorded in 31 of these 69. There are several sib-ships of three and one of four individuals in the group. In the group of 69 adults, the age at onset was given as follows:

AGE AT ONSET	VISION		
	Less Than 2/200	2/200	20/200+
Under 1 year	3	2	0
2 to 9 years	9	1	4
10 to 14 years	1	2	3
15 to 20 years	6	2	3
21 to 49 years	21	5	5
50 and over	0	1	1

Treatment is difficult to evaluate because of the variations in age of onset and course. Many affected persons of 50 or more will state that their vision, while very poor, has been unchanged for years. Not long ago I did an operation for uncompensated glaucoma on the eye of a 70-year-old woman who had been night blind for decades. She still has 20/200 vision but with only a 10° field. The progress of the degeneration is usually so gradual, and subject to long periods in which no change occurs, that arrests reported after a few months or years of this or that therapy must be weighed carefully. In the last decade cervical sympathectomy to improve the blood supply has been highly lauded and already discarded.

Unlike the albino, these persons have known good vision. The loss, particularly of the visual field, is always crippling. The prognosis for the person with retinitis pigmentosa is economic blindness and, due to the reduced visual field, loss of traveling sight as well.

Prevention has more to offer than treatment. Prevention of consanguineous marriages in affected families is indicated. One case known to me personally related that her parents were first cousins and to make it worse the mother had "night blindness." Three offspring eventually became totally blind from retinitis pigmentosa. In some families the condition is apparent fairly early in the life of the offspring. Once it occurs, the size of the family should be limited.

In Berens' study 175 (6.5 per cent) of the children were blind due to congenital glaucoma. At our state school twelve were admitted in ten years. The condition is usually apparent at birth but may not be noticed until some months later. The prognosis for individuals with congenital glaucoma for retaining vision of any degree for many years is very poor. Anderson's recent and exhaustive monograph on the subject supports this pessimistic view. An occasional individual does maintain

some sight but is always in danger of losing it entirely. Of the adults (seven) known to the State Agency, none have traveling sight. Complete blindness can often be delayed through part of childhood by proper surgical management but, because of the improbability of retaining useful vision into adult years, the child with congenital glaucoma should have guidance in education to select and train for an occupation which, if necessary, a blind or near blind person could carry on.

Congenital cataract occurs with much greater frequency than congenital glaucoma and the outlook for those affected is not quite so dark. Berens found 461 (17.1 per cent) of the blind children were there because of cataract. At our school there were 59 (16.7 per cent) admitted in the ten years studied. On blind relief at present are 46 (4.7 per cent). It is interesting that in this group of 46, there are none who recovered good vision after operation in childhood, kept it into adult years, and then lost it. The assumption can therefore be made that if good vision is secured by surgery on a congenital cataract, with reasonable care it can be maintained, at least above the level of economic blindness. In the group of 46 referred to, 29 have less than 2/200 vision.

A recent paper by Hilgartner on the management of juvenile cataract, gave the following visual results in 39 cases: no record in 14; less than 20/200 in 24 eyes and only hand movements in 4; no vision at all in 1. He secured 20/200 in 14 eyes, 20/100 in 3, 20/65 in 4, 20/40 in 1, and 20/32 in 2.

The child with congenital cataracts, then, can nearly always have his vision improved—it must be done early—but the chance for securing really good vision, say 20/40 or better, is not great. Like the albino, many persons who have had congenital cataracts operated on in childhood acquire ability to carry on activities far beyond that of an adult whose vision has suddenly been reduced to a correspondingly low level.

The literature on the management and surgical technics for so-called senile cataract is voluminous. Most of these adult type cataracts appear after 60 years of age. The successful operation on them can offer but another decade or so at the most of useful vision. The congenitally cataractous eye must last a lifetime. Therefore, all the more need for careful preoperative study to select the proper procedure, the choice of the most favorable time for operation, and more watchful after-care. At best the visual results are often disappointing so, the more care to insure a perfect surgical result, the better. Because of their relative simplicity, most needlings on congenital cataracts are taken too lightly.

In addition to the four conditions already considered, glaucoma, ulcerative keratitis, cataract, monocular injuries, and the optic neuropathies will be discussed as causes of blindness in youth and adult years.

One hundred three persons (10.7 per cent) of the blind on the state aid rolls at present lost their vision because of glaucoma. A few had the acute hemorrhagic form, but the majority had the slowly progressive painless type. In the latter group many neglected to seek any medical advice until vision was practically gone. In the face of such an apparent apathy to visual loss, sympathy for the glaucomatous blind might easily be lost. However, with more widespread information concerning the possible significance of changes in vision in the middle and later decades, some of these people may be placed under treatment earlier in the disease. For it is well known that the progress toward blindness can be arrested in most instances, and the arrest could most profitably be done early before useful vision is lost.

The management of glaucoma is described in detail in our ophthalmology text books and periodicals. Nevertheless, when reviewing this list of 103 cases of bilateral ocular deaths, certain things not commonly found in textbooks are apparent.

Glaucoma does not usually affect both eyes with equal severity at the same time. A person may have one nearly blind eye, its fellow showing but very early symptoms and signs of glaucoma. Should both eyes be operated on? There can not be any hard and fast rule; but, remembering that surgery in this disease may save vision, seldom restore it, there are then more indications for surgery on the better eye than on the near blind one. There are persons now on our blind aid rolls in which the reverse and usual procedure was done, that is, the nearly

blind eye was operated on, its fellow treated with miotics.

Through lack of understanding in the use of the drops or to loss in efficacy of the miotics, vision was lost in this eye and, though surgery was again recommended, in some instances it was refused. When the first eye was operated on the patient may have been relieved of pain but that is quickly forgotten. He cannot forget, however, that he does not see any better as a result of the surgery. Therefore, he refuses to submit to operation on the other eye. Blindness is then inevitable.

Again, as we read the reports of the value of this or that type of operation for glaucoma, it is found that of a certain number operated on follow-ups were available on a smaller number. The writer reports the controlled tension group, and occasionally he will state that re-operation was necessary. It is usually not the successes that end on the blind relief rolls. And it also is the group of "no follow-ups" that most likely end with no vision. A successful operation should not be reported within a few months or even a year or two.

Not long ago an applicant for blind aid gave the name of a surgeon as reference. In response to an inquiry, he wrote that the applicant might possibly be eligible for direct relief, but he doubted whether she could be blind as he had operated on her eyes "quite successfully" in 1926. He had not seen her since. Immediately successful surgery does not insure permanent or life-long retention of vision. Only persistent periodic follow-up, re-operation if necessary, can protect the patient with glaucoma. Even then, the end is sometimes failure, but much less frequently so than otherwise.

Retention of useful vision in a glaucomatous eye can not be left to chance. It is the reward of constant vigilance on the part of the patient and doctor.

Ulcerative keratitis results in either extension of the process into the eye and eventually phthisis, or, if the lesion heals, the cornea becomes opaque and vision reduced. In Berens' study, corneal lesions caused blindness in 389 children (14.4 per cent). Ulcerative keratitis made up 277 cases in the group. He stated that two-thirds of the latter were due to ophthalmia neonatorum. In our recent study there were 45 persons blind due to ulcerative keratitis, with 15 of the group due to ophthalmia neonatorum. For the remainder (trachoma cases not included) a variety of precipitating factors were given.

The corneal scars from ophthalmia neonatorum should now be a thing of the past as there is practically no excuse for the disease to occur. At present there are 33 adults on our state rolls who were blinded because of it—15 with corneal scars, the others with phthisis bulbi.

A review of the histories of those blinded by ulcerative keratitis due to other causes confirms the impressions acquired in private practice. The tendency of many regular and irregular practitioners to treat every painful or inflamed eye with weak washes, or the ubiquitous yellow oxide or argyrol, using anesthetic drops to lull themselves and the patient into temporary comfort, is responsible for many extensive corneal ulcers, a great deal of monocular blindness and some of our bilateral blindness. It is readily granted that some cases of serious loss are unavoidable but by far the majority of them can be cured before serious loss of vision occurs.

Every abrasion, every pin-point break in the corneal epithelium is a potential killer of visual acuity and should be treated as such. Where an ulcer covers the greater part of the cornea, intelligent therapy may still save the globe, but seldom a useful eye. The blind and near-blind from ulcerative corneal lesions are usually an uncomfortable group. Scars tend to break down, lacrimation is profuse. The little vision present is seldom well utilized.

On our Aid to the Blind rolls are 114 persons reported blind due to cataract. Forty-six of these were congenital or hereditary and have been discussed. In the remaining group of 68 are several very aged and feeble persons on whom surgery was not urged. The remainder have either had complications before, during or after surgery resulting in little return of vision. The causes of the cataracts range from the large group (52) of unknown cause other than age changes, to the cataracts of tetany and of diabetes and of scleroderma. On the whole, the percentage of blind due to cataracts in Minnesota is rather low as compared with other statistical studies.

The adult aphakic person with vision of 20/70 or less makes far less use of his vision than the aphakic person who had congenital cataracts and a comparable visual acuity. For really usable vision, the adult aphakic must have at least 20/40. Less than that, to a person accustomed to a lifetime of reading, etc., is not satisfactory, as witness many applications for blind pension by persons with vision of 20/40 or even better after what might be termed successful cataract surgery.

Monocular injuries may result in total blindness. Sympathetic ophthalmia is a form of iridocyclitis or uveitis. It occurs almost exclusively after a penetrating wound of one eye. The incidence after penetrating wounds has been estimated at from 1 to 3 per cent and in proportion to all ocular diseases it ranks 0.15 per cent. Once it occurs, serious loss of vision is inevitable and blindness is the result in a high percentage of cases.

It is not the eye that is recognized as hopelessly damaged but the one which attempts are made to save, that is the dangerous one. This is not a plea for immediate removal of all injured eyes. Many can be saved and retain useful vision. Also the incidence of sympathetic ophthalmia is low. Just because this type of reaction after injury is not seen often in any one man's experience does not mean, however, that long chances should be taken.

A glance at the table below, result of a study made in 1938, will show the significance of the condition and the need for keeping it constantly in mind.

	Blind Aid 1937-38	Minn. School for Blind, 1937
Number of cases	31	8
Average age when injured	14.1 yrs.	4.75 yrs.
Average age when blind	18	5
Average age in 1938	47	14
Average number years blind	29	9.6

Most of the injuries happened in childhood or adolescence. Earlier and more adequate care of all eye injuries could greatly reduce the number of children becoming blind from sympathetic ophthalmia. Procrastination and indecision in treatment cause the period of relative safety—two weeks—to pass.

The danger of involvement of the uninjured eye is then increased many fold with every passing day. Every penetrating wound of an eye should be regarded in the light of possible bilateral ocular death. If there is any chance of losing a patient to a serious disease, consultation is invariably sought. Ocular mortality could be reduced by the same methods, but consultations are of most value *before* sympathetic ophthalmia develops. A study of the cases listed shows that there was either delay in seeking treatment, loss of time after advice was sought or attempts to save a severely wounded eye in every instance. It is known that prompt and intelligent care of monocular injuries could almost, if not entirely, eliminate sympathetic ophthalmia. That knowledge still needs to be put into practice.

The optic neuropathies—183 cases (19.0 per cent of all causes) is the last group to be mentioned.

The causes of optic atrophy are numerous. In the classification used, these causes fall into thirty groups which could be broken down still more. The most significant groups are:

- 43 of the 183 cases—due to acquired syphilis.
- 16 of the 183 cases—brain tumor or tumor equivalents.
- 36 of the 183 cases—no cause known.

The syphilitic optic atrophies require no further comments save that the number shows the significant need of early and adequate treatment. Many of those so affected are still on treatment, but with no return in vision. The treatments recommended for luetic optic atrophy are many and the claims for some do bear consideration, but the attack is on the wrong end of the line. If syphilis is not prevented, it must be thoroughly treated early—else the luetic atrophies will be a group that is always with us.

The atrophies secondary to increased intracranial pressure, 16 in all, are interesting in that in each case vision was lost before surgery was done. The duration of visual disturbances before diagnosis in five cases with adequate histories ranged from one to five years. Since brain surgery has advanced so that life may be saved in some types of tumor, earlier diagnosis might save a few from blindness as well.

In every group of optic neuropathies there are a number to

which no etiology can be assigned—in this study, 36 of the group of 183. With etiology unknown, prognosis is made more difficult. Many of the applicants have been blind or near blind for years and the cause is not apparent so the examiner lists it as atrophy, cause unknown. A few of these unknowns have been unraveled and diagnosis established by the data accumulated at the Bureau. In one case with several examinations on record, the cause of the optic atrophy was listed as "possibly from a blow on the head." Later data turned up showing that an offspring had the interstitial keratitis of congenital syphilis. In another case the only cause recorded was "onset while working in brilliant light as a window washer." More detailed examination and history were requested, and a classic case of Leber's hereditary optic atrophy discovered. This latter case is again illustrative of the value of peripheral fields. Though there are dense central scotomas due to atrophy of the papillo-macular bundles and central vision is but 20/800, the applicant gets about with comparative ease and has held jobs as porter for several years since losing his vision. In optic atrophy, just as in the various congenital anomalies, traveling vision depends more upon the presence of intact peripheral fields than any other factor.

In this review of a few of the long list of causes of blindness, emphasis has been placed upon prognosis in some instances, on possibilities for prevention in others. Our literature is filled with the triumphs of treatment and surgery. However, for a very humbling and challenging experience, I can recommend a study of the blind—our ocular postmortems—for, as Meding has put it: "To the ophthalmic surgeon blindness is death."

Thus by hindsight we see what might have been prevented and so gain in foresight and prognostic knowledge, we hope, to the lessening of the number of the unnecessarily blind.

DISCUSSION

Dr. KENNETH PHELPS: Dr. Stanford has covered a very large subject in an admirable manner. Blindness, as he said, may result from practically any eye disease, from a cinder in the cornea to optic atrophy.

His study is limited to those patients who are on state relief or in state institutions for the blind. It is worthy of note how few of these patients are blind from ophthalmia neonatorum. Another frequent cause of blindness, trachoma, is rapidly vanishing, due to the use of sulfanilamide.

It is well to be reminded what our state is doing for the blind and to realize that some advances are being made constantly in the prevention of blindness.

I enjoyed Dr. Stanford's paper very much and congratulate the Clinical Club upon adding another valuable member to its organization.

Dr. WALTER H. FINK: I wish to congratulate Dr. Stanford on a fine presentation. It is unfortunate that we cannot hear more of such presentations. This is a phase of medicine with which we should all be more familiar. In preventing blindness many of us may have the impression that we refer only to conditions such as mentioned this evening. These conditions are but one phase of the problem and most of the eye conditions mentioned in Dr. Stanford's paper are comparatively rare.

The greatest field for prevention of loss of vision is found in the early period of life. Children come into the world with refractive or muscular ocular defects. Early care of these will to a large measure prevent a permanent loss of ocular efficiency. These eye conditions should be taken care of early in life because most of the visual development occurs before 6 years of age. It is my belief that oculists should routinely examine the eyes of a child at 1 year of age. This can be done very satisfactorily and very simply with the retinoscope and the ophthalmoscope. In most instances the ophthalmologist is consulted when the child starts school, and this is practically always at the insistence of the school nurse. Treatment at this time is helpful, but many permanent defects could be avoided if the difficulty could be corrected at an earlier age.

Dr. L. R. BOIES: I would like to ask Dr. Stanford the following questions:

- How many blind people are on state care?
- What is the cost of this care to the state?

Does the state provide assistance to a person who is economically blind and who wishes to and has the capacity to attend college?

What percentage of the blindness could be prevented?

Dr. CHARLES E. STANFORD: Two years ago there were 17 out of some 700 that were blind due to trachoma. At the present time we have between 30 and 40 out of slightly less than 1,000 cases. Most of those are long standing cases. These that have applied in the last few years have not become blind in the last few years. Their defects are of long standing. I understand there is a good piece of work going on now on the Reservations with the use of sulfanilamide. The Indians are responding to it. In my practice we see very little of it. We had one boy with violent exacerbations of an old trachoma. He had a violent flareup and after four days on sulfanilamide his lachrymation disappeared. The trachoma has remained inactive since that time.

Along the lines that Dr. Fink mentioned, the monocular blind due to squint—I kept a list of the students I happened to see at Health Service the last year who came in for routine refractions, and, while I could not give the exact figure, I know it is over 50 who are economically blind in one eye. Those are squints or cases of anisometropia. A few are due to injuries.

In reply to Dr. Boies' questions, at the present time there are nearly 1,000 recipients of blind aid and the total aid program runs up to about \$160,000 a year for that group. That

does not include about 200 blind on old age pensions who receive an average of about \$23.00 a month. Incidentally, the operating expenses for the blind aid program are between \$7,000 and \$8,000. The higher educational aid is given to deserving students. I think there are eight or nine at the University now. The State will furnish them with a reader. I think the total advanced educational fund is about \$2,000 a year. The total blind program for Minnesota runs up about \$400,000 including Faribault. It costs about \$500 a year to keep a student at the State School and if they are there from early childhood on, they are there for 16 years, the average cost of the congenital blind or those blind from early childhood is about \$8,000.

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ERNEST R. ANDERSON, M.D., Secretary.

Secretary's Letter

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

The second phase of the work of the Committee on Medical Preparedness has been entered upon. The first phase was aid in the procuring of answers to questionnaires relative to special fitness for certain types of work of the individual physician. We are not being asked to aid the War Department in determining which of its medical reserve officers can best be spared from their communities and their families. It is not the desire of the War Department in furnishing the medical officers necessary, to work undue hardship on the family nor on the community. Reports are now being asked from the District Medical Preparedness Committees on members of the Officers Reserve residing in their communities. From these reports the State Committee will report to the Corps Area Chairman.

The Women's Auxiliary of the South Dakota State Medical Association have become interested in the past two years, in the establishment of a Benevolent Association to assist in the care of needy physicians, their widows and families. Such associations have been established in several states in the Union either by the Medical Associations or their Auxiliaries. Pennsylvania, Tennessee, Colorado and Texas are at present sponsoring some type of program along this line. Last year at our state meeting in Watertown, the Auxiliary appeared before the House of Delegates and made known their plans and desires along this line. The House of Delegates authorized the diversion of 50c per member of state funds for this year to that purpose and the appointment of a committee to cooperate with the women in the formal set-up of the plan. The chairman of the Council at a recent meeting, appointed as this committee, Dr. D. S. Baughman, Madison, Dr. W. E. Donahoe, Sioux Falls, and Dr. C. E. Sherwood, Madison. This committee met with representatives of the Auxiliary in Sioux Falls on the afternoon of January 14th and preliminary plans were discussed for the organization. It was decided that the fund should be in charge of the Auxiliary and administered by a Board composed of members of the Auxiliary and the committee appointed from the Medical Association advisory to them. Plans for the enact-

ment of amendments to the By-Laws of the Auxiliary are being prepared, authorizing such an organization.

Tentative plans do not contemplate the expenditure of these funds until such time as a small reserve has been established. At the present time the Auxiliary has approximately \$300 in the fund. Approximately \$150 will be forthcoming from the medical association and the women have under way, plans for raising of further funds from Auxiliary members. The permanent organization, when it gets under way, will thus have a fairly good start. It is contemplated that when the fund really gets going that in addition to financial support, both from the Medical Association and the Auxiliary, that support will also be sought from individuals both in the form of bequests and legacies. This is a worthwhile project and merits the support of every physician and his family.

Plans for the annual session at Mitchell, May 18, 19, 20, are going forward. A good program is being planned and next month we should have a tentative program for you.

Every member should get his dues in at this time. They will be delinquent March 1. Let's help your secretary get his report in on time.

There will be a regional meeting of the American College of Surgeons in Minneapolis, March 10, 11 and 12, with headquarters at the Nicollet Hotel. Participating in this meeting are surgeons from Minnesota, Wisconsin, North Dakota, South Dakota, Iowa, Nebraska, Kansas, Montana and Manitoba. Every member of the state association is welcome at all clinical sessions whether members of the College or not. These meetings are always worthwhile and should be largely attended.

C. E. SHERWOOD, Secretary.

News Items

The 1941 annual session of the North Dakota State Medical association will be held in Grand Forks. The tentative dates are set for May 19-21. A program consisting of papers, symposiums, and round-table discussions is being planned by the Committee on Scientific

Program, the personnel of which is as follows: Drs. R. D. Campbell, J. E. Hetherington and R. E. Leigh, all of Grand Forks; Dr. C. J. Glaspel of Grafton; Dr. L. W. Larson of Bismarck.

The Board of Regents of the University of Minnesota School of Medicine announced on January 10, 1941, that they would confer a new degree—master of public health. This new degree will take the place of the former certificate in public health. Candidates will be required to have prior professional training and a professional degree.

At the annual meeting of the Sixth District Medical society held in Bismarck, North Dakota, Dec. 17, 1940, the following officers were elected: President, Dr. DeWitt Baer, Steele; vice-president, Dr. George Monteith, Hazelton; secretary-treasurer, Dr. W. B. Pierce, Bismarck; board of censors, Dr. G. R. Lipp, Bismarck; delegates, Dr. R. H. Waldschmidt, Bismarck; Dr. O. T. Benson, Glen Ullin; Dr. C. C. Smith, Mandan.

Dr. W. C. Martin was elected chief of staff of St. Mary's Hospital, Duluth, Minnesota, to succeed Dr. P. S. Rudie, at a meeting held January 2. Dr. P. F. Eckman was named chief-elect.

Dr. William Rademaker, formerly of St. Paul, Minnesota, is now associated with Dr. H. W. Arndt of Detroit Lakes. He will also have an office at Ogema.

Dr. T. B. Moore, Jr., Kalispell, Montana, was elected president of the medical staff of the Kalispell General hospital at a recent meeting. Dr. J. R. Delaney was named vice-president.

Dr. Hans E. Guloiien, formerly of Willmar, Minnesota, recently established a practice in Minnewaukan, North Dakota.

Dr. H. A. LaFleur of Lakota, North Dakota, will take over the practice of the late Dr. Brent Odegaard of Mayville, North Dakota, the early part of February.

Dr. Henry W. Woltman, consultant on neurology at the Mayo Clinic, has been named as a member of the Advisory Council on Nervous and Mental Diseases. The appointment was made by Surgeon General Thomas Parran.

Dr. A. H. Borgerson, formerly of Sebeka, Minnesota, has established offices at Long Prairie.

Dr. L. H. Fredericks, Bismarck, North Dakota, has been named to the county insanity board to succeed the late Dr. Stackhouse. Dr. W. B. Pierce will succeed Dr. R. B. Radl as county health officer. Dr. Radl was recently named medical officer for the selective service program in North Dakota.

Dr. M. G. Ericsson, formerly of Long Prairie, Minnesota, recently established a practice in Cedar Falls, Iowa.

Nomination of Dr. Herald R. Cox, principal bacteriologist of the United States Public Health service, to receive the 1940 Theobald Smith award in medical science, was announced January 7 by the health service. The honor was conferred on Dr. Cox, stationed at Hamilton, Montana, for his research in the rickettsial diseases.

Dr. Frank M. Petkevich of Chicago, Illinois, is now associated with Dr. J. A. Roy in the Red Lake Falls Clinic, Red Lake Falls, Minnesota. He replaces Dr. L. F. Leitschuh, who is entering the United States army service.

Dr. A. M. Call of Rugby, North Dakota, was elected president of the Devils Lake District Medical society at a recent meeting of the society. Dr. Bernard Hughes, Rolla, North Dakota, was named vice-president.

Dr. H. R. Brown, Watertown, South Dakota, was elected president of the Watertown District Medical society at a recent meeting. Dr. A. E. Johnson was chosen as vice-president.

Dr. Charles A. Arneson, city health officer of Bismarck, North Dakota, has been announced as the 1940 winner of the Bismarck Junior Chamber of Commerce distinguished service award.

Dr. Pattison A. Waters, formerly of Kansas City, Missouri, is the new chief medical officer at the Veterans hospital of Fargo, North Dakota. He succeeds Dr. W. L. Fleck, who has been transferred to the Albuquerque (New Mexico) Veterans hospital as chief medical officer.

Dr. Gordon Anderson of Deer Lodge, Montana, was recently elected president of the Mount Powell Medical society.

Dr. James N. Dunn, St. Paul, Minnesota, was elected president of St. Joseph's hospital staff at the annual meeting of the executive board January 23. He succeeds Dr. Ernest Hammes. Dr. William Kennedy was named vice-president.

Dr. S. A. Cooney of Helena, Montana, has been reappointed by Governor Roy E. Ayers to the state board of medical examiners for a term expiring January 1, 1948.

A meeting of the Farmers Union local held in Glasgow, Montana, January 3, featured a discussion of a tentative plan for operation of a coöperative hospital in Glasgow.

Dr. D. W. Pollard, Minneapolis, Minnesota, became superintendent of General hospital officially on January 17, when the board of public welfare acknowledged a certification sent to it by the civil service commission.

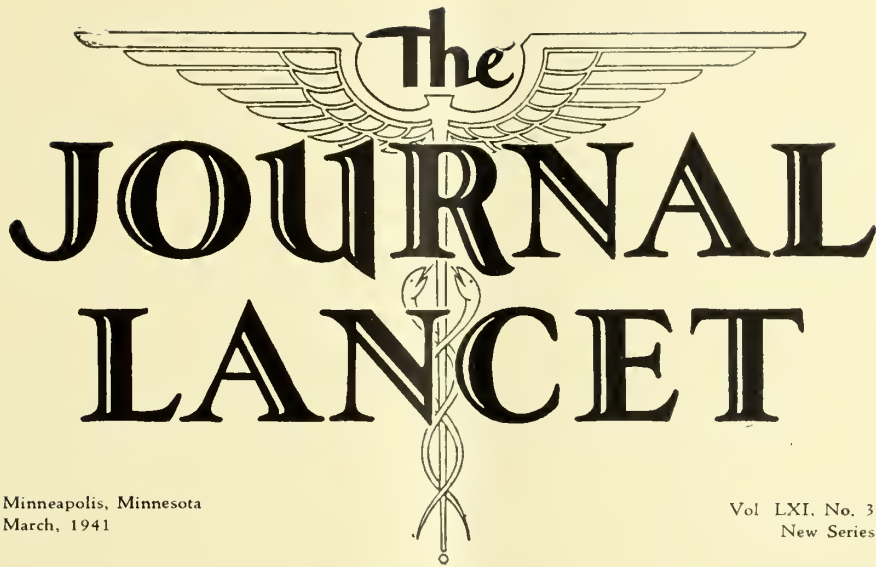
Dr. H. L. Casebeer, Butte, Montana, left January 26 for Los Angeles, California, to attend the 10th annual midwinter clinic on ophthalmology and otolaryngology.

Necrology

Dr. C. E. Stackhouse, 55, Bismarck, North Dakota, died December 19, 1940, at his home.

Dr. Charles F. Coulter, 65, retired Great Falls (Montana) physician, died at his home in Missoula, January 2, 1941.

Dr. Hugh H. Slocumb, 58, died at his home in Avon, Minnesota, on January 7, 1941.



Minneapolis, Minnesota
March, 1941

Vol LXI, No. 3
New Series

Beta Irradiation in Ophthalmology*

Wilhelm K. Stenstrom, Ph.D.

Edward P. Burch, M.D.

Francis M. Walsh, M.D.

Minneapolis, Minnesota

FOR the past two and one-half years those lesions of the anterior ocular segment resistant to the various medical treatments have been exposed to beta ray radiation. To date nearly seventy-five patients, from private practice, the Wilder Free Dispensary, and the University of Minnesota Hospital Eye Clinics, have been subjected to this type of treatment. A great variety of lesions have been treated. From the results that have been obtained during the past two and one-half years, it is apparent that inflammatory states of the cornea constitute the chief indication for the type of therapy under discussion.

Before launching into a discussion of the results, a description of beta rays and the method of their employment is in order. The disintegration of radioactive elements liberates energy in form of rays. In radium emanation these are alpha, beta, and gamma rays. The alpha rays, which are positively charged helium ions, constitute about 90 per cent of the total rays discharged. They have practically no power of penetration and are valueless for purposes of therapy.

The beta rays are negatively charged electrons with a very low power of penetration. Their passage is stopped by one-half millimeter of platinum, one millimeter of lead or two millimeters of brass. Seventy-five per cent of the beta rays are absorbed in their passage through the first two millimeters of tissue and 15 per cent are stopped by the second similar thickness. Gamma

rays are the hard rays of high penetrating power which are used in the ordinary forms of radium treatment. They do not carry any charge and are similar in nature to light.

The beta rays with which we are concerned come from disintegration products of radon which is obtained by pumping off the gas from a radium salt solution into a glass bulb less than one millimeter in thickness. This glass bulb is placed in a small cylindrical metal container with walls of gold and brass which are two and one millimeters in thickness respectively. The bottom consists of brass 0.2 millimeter in thickness which permits beta rays to pass through and be directed at the desired area of treatment. A long metal rod is attached to the top of the container for convenience of handling the applicator and for protection from radiation. The whole apparatus is called a beta ray bomb. It is necessary to make careful measurements of the radon and keep track of its disintegration by means of calculated tables. The amount of radon contained in the applicator has varied from fifty to two hundred millicuries for the different treatments.

One hundred and fifty to two hundred millicurie minutes is the dosage given in a single treatment. As a rule treatments are given at intervals of one week. Three to six treatments constitute a series. At least a month is allowed to elapse between series and no more than three series have been given to a single patient.

*From the department of ophthalmology, University of Minnesota.

TABLE I.
Effect of Beta Irradiation on Parenchymatous Keratitis

Case No.	Visual Acuity Before Therapy	Number of Treatments	Visual Acuity After Therapy	Comment
1.	R. E. = 20/200 L. E. = C. F. 1 ft.	8 in 9 mos.	R. E. = 20/65 L. E. = C. F. 5 ft.	Marked reduction in corneal vascularity
2.	R. E. = C. F. 3 ft. L. E. = C. F. 3 ft.	5 in 8 mos.	R. E. = 20/200 L. E. = 20/200	Definite clearing of corneal opacities
3.	L. E. = 20/100	5 in 5 wks.	L. E. = 20/30	Cornea practically clear
4.	R. E. = 20/30 L. E. = 20/65	2 in 1 mo.	R. E. = 20/20+2 L. E. = 20/40	Marked shrinking of blood vessels and clearing of interstitial scarring
5.	L. E. = L. P. only	4 in 8 mos.	L. E. = 20/100	Complete subsidence of pain. Eye about to be enucleated before treatment
6.	R. E. = 20/65	3 in 2 mos.	R. E. = 20/15	Complete clearing of cornea. Only shadow vessels remain in substantia propria
7.	R. E. = C. F. 1 ft. L. E. = C. F. 1 ft.	2 in 1 mo.	R. E. = 20/200 L. E. = 20/200	Also had peritomies to aid obliteration of extreme vascularization. Recent relapse in clinical improvement after Beta irradiation

Before delivering the beta rays to the lesion, the eye is anesthetized by instillation of several drops of $\frac{1}{2}$ per cent pontocaine solution and a lid speculum is inserted to avoid the necessity of exposure to the technician's fingers. Sometimes the patient can hold the lids apart and anesthesia is omitted. The applicator is held as near the eye as possible without actually making contact with the globe. The bomb is kept constantly in motion. A dosage of one hundred and fifty millicurie minutes if applied directly to the skin will approach the erythema threshold; hence the necessity of keeping the bomb in motion to be sure that no portion of the eye receives sufficient beta irradiation to approach this threshold.

Considering the technique of treatment, the dosage employed, and the penetrating power of beta rays, it is apparent that only the conjunctiva, sclera, cornea, and peripheral portions of the iris can be subjected to beta ray irradiation. The rays do not reach the lens in appreciable quantity. In all the patients treated, no ill effects such as lens opacity, glaucoma, or activation of quiescent lesions of the cornea have been noted. A few patients have complained of slight discomfort for a few hours immediately after receiving therapy.

If the bomb contains one hundred millicuries and a dose of two hundred millicurie minutes is desired it has to be applied for two minutes. If the strength is greater or less the length of time it must be applied is shortened or lengthened in proportion. The number of treatments administered to a patient is largely governed by clinical improvement as observed at frequent examination. The advantage of slit lamp observation is so obvious as to require no further comment.

The action of the beta rays is thought to be fourfold: (1) leucocytes are destroyed with attendant liberation of their antibodies, thus effecting a secondary immune action; (2) capillary vessels are obliterated by endothelial destruction; (3) irradiation causes a shrinking of connective scar tissue; (4) the corneal corpuscles are capable of producing local immune bodies and beta irradiation accelerates this capacity. The bacteriolytic

effect of beta rays on pathogenic micro-organisms is thought to be very slight.

We may now pass to a consideration of the results which have been obtained. These will be presented in a necessarily abbreviated tabular form. The cases included in this report have all been observed for a period of at least three months since receiving their last treatment and are grouped according to the clinical diagnosis. The question of concomitant treatment with local measures deserves comment. Almost without exception the orthodox local measures such as heat, cycloplegics, and in many instances, dionin or yellow oxide ointment have been employed during the active stages of the lesion. Foreign protein therapy has also been used. Beta irradiation has as a rule been instituted only after the maximum benefit from such measures has been attained so that it is our feeling that to a great extent any improvement in vision or the clinical appearance of a given lesion is attributable to the effect of the beta rays. The visual acuity has been carefully noted in each case before commencing irradiation therapy and as frequently thereafter as possible. It is manifestly impossible to gauge the improvement which will occur spontaneously in a given case with the lapse of time but we have sufficient chronic cases in the series in which striking improvement has occurred only after beta irradiation to compel us to believe that such improvement is solely attributable to the irradiation.

From the results which have been given, it seems justifiable to conclude that the beta irradiation of inflammatory disease of the anterior portion of the eye due to tuberculosis, lues and possibly the herpes virus may constitute a very worthwhile procedure.

Among other types of lesions which have received beta irradiation and which have been adequately followed but which do not occur with sufficient frequency to present in tabular form may be mentioned the following: One case of corneal scar due to an old penetrating injury which received four treatments and whose vision improved from 2/100 to 20/100 plus; a case of old trachomatous pannus whose vision improved from 20/65

TABLE II.
Effect of Beta Irradiation on Tuberculosis of Anterior Segment

Case No.	Visual Acuity Before Therapy	Number of Treatments	Visual Acuity After Therapy	Comment
8.	R. E. = L. P. L. E. = L. P.	5 in 5 wks.	R. E. = L. P. L. E. = L. P.	Both corneae completely opaque. No improvement expected
9.	R. E. = L. P. L. E. = L. P.	3 in 3 mos.	R. E. = C. F. 6 in. L. E. = 20/200	Moderate clearing of corneae. Lesions quiescent. To get more irradiation later
10.	L. E. = C. F. 3 ft.	3 in 1 mo.	L. E. = 20/50	Episcleral nodules disappeared. Corneal inflammation subsided
11.	L. E. = 20/20	3 in 3 wks.	L. E. = 20/20	Episcleral nodules completely healed. Corneal opacity clear
12.	R. E. = 20/65	7 in 6 mos.	R. E. = 20/65	Episcleral nodules and cornea cleared and then relapse occurred twice during period of treatment
13.	R. E. = L. P.	3 in 3 wks.	R. E. = L. P.	Patient has occluded pupil from old plastic cyclitis. Cornea much clearer and K.P. disappeared after treatment. No visual improvement expected
14.	R. E. = 20/65	4 in 6 wks.	R. E. = 20/25	Vision was 20/65 six wks. after last treatment and cornea has remained clear to date, 10 mos. after therapy
15.	R. E. = 20/200 L. E. = 20/200	5 in 5 wks.	R. E. = 20/100 L. E. = 20/40	Inflammation completely subsided. No relapse 7 mos. after last treatment
16.	R. E. = H. M. 2 ft. L. E. = H. M. 2 ft.	5 in 5 wks.	R. E. = H. M. 2 ft. L. E. = H. M. 2 ft.	Corneal scars very dense. Lesions present at least 15 yrs. No improvement expected
17.	R. E. = 20/40	5 in 5 wks.	R. E. = 20/30+2	Cornea partially cleared. Eye quiet 8 mos. after last treatment
18.	R. E. = H. M. 2 ft. L. E. = H. M. 2 ft.	5 in 5 wks.	R. E. = H. M. 2 ft. L. E. = H. M. 2 ft.	No improvement. Corneal scars very dense. Lesions present at least 5 yrs. No improvement anticipated

to 20/40 after two treatments; one instance of corneal scarring as a result of *ulcus serpens* with visual improvement from 20/200 to 20/40 after two treatments (this patient will return for further therapy); one case of dense corneal leucoma following abscess of the cornea where improvement from counting fingers at 4 feet to 20/30 resulted after five exposures to the beta rays.

The corneal grafts which were beginning to become opaque received intensive treatment without appreciable benefit. Two cases of corneal dystrophy of an unusual type which could not be classified were not benefitted and one case of lattice or grill-like dystrophy also was not helped. One case of ocular pemphigus in an advanced state of cicatrization remained unchanged by beta rays. Two cases of corneal vascularization following a McReynold's procedure for transplantation of pterygium showed definite improvement with respect to shrinking of blood vessels. The vision which was normal in each instance remained unaltered. One case of epithelioma of the limbus and one dermoid of the limbus, both of which were removed surgically, but probably with some cancer cells remaining, received beta irradiation to the vascular bed of the tumor with beneficial results. There was no improvement of vision because of the peripheral location of the tumor in each instance. Two cases of follicular conjunctivitis without corneal pathological changes were treated but exhibited no improvement. One case of recurrent marginal ulcer of the cornea received no benefit from three beta irradiation treatments. A case of extremely indolent central corneal ulcer which had failed to respond to any of the conventional methods is of interest. A boy, age 10 years, received a traumatic ulcer which became badly infected. The lesion was treated for eighteen months without complete restoration of corneal epithelium occurring for more than brief

periods of time. The lesion broke down repeatedly. After three applications of beta rays healing was established and the ulcer has remained healed for six months. Because of the central location of the process, vision was reduced to 20/200 and there has been no improvement from this standpoint.

Another case was that of a young adult male who splashed hot lead in his eye with resultant keratitis and symblepharon. The cornea was treated medically for three months with no improvement. When beta ray irradiation was begun the visual acuity was 3/200. Following a course of four treatments in five months his vision improved to 20/100 and 20/25 corrected. Practically all the corneal opacity was cleared. The symblepharon was corrected surgically.

An analysis of our results indicates that beta irradiation is most effective in lesions where vascularization is a prominent feature. This is in accordance with the known biological effect of irradiation upon endothelial tissue. Experience has as yet not taught us the most favorable time to begin beta irradiation in inflammatory disease of the cornea such as interstitial keratitis and kerato-iritis of tuberculous origin. While the results with respect to clearing of infiltrates and "de-vascularization" of the cornea in these conditions have been promising, it is still undecided at which stage treatment should be begun to secure the best advantage. In the past we have been inclined to treat cases of keratitis as soon as it is felt that the maximum benefit has been attained from conventional methods of treatment. In the future, convinced of the efficacy of beta rays, we shall endeavor to begin therapy at an earlier stage in an effort to limit the damage from corneal scarring and to favorably modify the duration of the inflammatory process. We have learned that it is futile to expect benefit in old

TABLE III.
Effect of Beta Irradiation on Dendritic Ulcer of Cornea

Case No.	Vision Before Treatment	Number of Treatments	Vision After Treatment	Comment
19.	R. E. = 20/400 L. E. = 20/200	1 in 1 wk.	R. E. = 20/200 L. E. = 20/80	Remarkable clearing of dendritic ulcer. To return later for more therapy
20.	R. E. = 20/200	2 in 2 wks.	R. E. = 20/65	Cornea shows definite healing
21.	R. E. = 20/40—1	2 in 1 mo.	R. E. = 20/30	Treated during period of relative quiescence. Healing apparently facilitated. Eye now perfectly quiet with only very faint nonvascular central nebula

densely scarred corneal leucomata. Likewise, on the basis of our limited experience, dystrophies of the cornea do not offer a promising field for radium therapy. Basal cell epitheliomas can probably be destroyed if the dose is carefully selected. It must be high enough without preventing the healing of the resulting superficial ulcer.

In 1937 Woods and Burch reported on the beta irradiation of the filtering cicatrix following iris-inclusion operations in colored patients. It was felt that the tendency of negroes to form excessive amounts of scar tissue which seriously compromised the patency of the filtering scar might be mitigated by irradiation. In a small series of cases the results were disappointing. It is interesting to note that Friedenwald has recently revived this same procedure in certain patients following corneal scleral trephine operations and reports good results in white patients. This manoeuvre may prove useful in selected patients and should be borne in mind. Newly formed

scar tissue responds better to radiation than old scars. Recurrence of keloids of the skin after surgical removal has often been prevented by prophylactic irradiation.

Up to the present time it is certain that the last word has not been said upon either the indications or possibilities for the use of beta rays in the therapy of disease of the anterior ocular segment. More time must elapse before we are justified in drawing any definite conclusions with regard to the permanency of results in this field, especially with respect to tuberculous lesions, where a tendency to relapse after treatment has been noted in several of our cases. We are not warranted in making any sweeping claims but have been gratified by some of the results obtained in this short series of various types of ocular disease.

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Arm Suspension After Breast Operation*

Arthur N. Collins, M.D., F.A.C.S.

Duluth, Minnesota

THE avoidance of arm swelling after radical breast amputation has been a problem for many years. Lymph drainage is interfered with after dissection of the axilla and of the clavicular region. Removal of the pectoral muscles also reduces lymph drainage.

Stiffness in shoulder motion after breast operation has also been a difficulty to overcome, so that much patience and encouragement are necessary on the part of both the surgeon and the patient in efforts to relieve this distressing feature.

*Presented with movie film at staff meeting, St. Luke's Hospital, April 18, 1940.

During the past ten years I have been using a method of arm suspension described here, which has seemed to me, to answer some of the unpleasant difficulties outlined above.

The patient's bed is equipped with an overhead bar. When she is returned to bed from the operating room and while she is still under anesthetic, the arm on the operated side is placed in upward extension, or rather suspension, from the overhead bar by means of adhesive tape, pulleys and weights. The tape is applied to the forearm but not above the elbow (figure 1).

A wood block is interposed between the tape and the suspension rope just beyond the tips of the fingers, and

the hand is thus free of the tape. The hand and fingers may be opened and closed at will.

The weight should be suspended from the bar somewhat toward the foot of the bed and the overhead bar placed toward the side of the bed corresponding to the patient's operated side.

The position of the arm is important. It should not be too high toward the head or approaching a right angle with the spine. It would be uncomfortable in such a position. It should be at an angle somewhat toward the foot of the bed. The surgeon may demonstrate the most comfortable angle by trying the position himself.

Only enough weight to balance the weight of the patient's arm is necessary. This may be adjusted for the individual patient. The weight should hang about midway between the bar and the bed.

As soon as the patient feels inclined, after recovery from the anesthetic, she is encouraged to move the fingers, hand and arm. This is often not necessary since she herself is curious concerning the apparatus and wants to see how it works. She therefore does this without much encouragement or suggestion. The patient shown here had a radical amputation of the breast, dissection of the axilla and of the infraclavicular region and removal of the pectoral muscles.

Change of dressings can be done without hurting the patient's arm. She can swing the latter out of the surgeon's way herself. There is plenty of room to work. Soiled dressings are easily removed and fresh dressings may be applied without having to move a painful arm.



Fig. 1. The Overhead Bar.



Fig. 2. The patient can flex or extend the arm at will.

Nursing care is facilitated and the patient may be moved about in bed freely because her arm is balanced by weights. She may be turned on her side or be propped up in a sitting position.

Most important, however, is the fact that at no time is the shoulder motion limited. The patient feels she has full active use of her arm.

The arm is kept suspended at least a week. During this time, drainage of serum has been in a direction away from the arm and healing beneath the skin flaps is well on its way.

This process of suspension has proved very satisfactory in my experience over a period of years. Some of my confreres who have used it also have found it useful. I have therefore described it more or less in detail should other surgeons wish to use it.

The Health of College Students and National Defense*

Ruth E. Boynton, M.D.†
Minneapolis, Minnesota

AT the time of our last annual meeting one year ago, few if any of us had the vision to see the far-reaching effects which the European war would have on our American way of life. During these past twelve months we have witnessed in our country the passage of the first selective service law in peace time. The young men in the country have had their draft numbers assigned to them, and one group has already been called to military service.

The first hurdle to be passed by these young men called for army service is the physical examination. In 1917 and 1918 the United States Army rejected as physically unfit approximately 30 per cent of the young men who were drafted for military service. The question which is being asked today is: Are the young men who will be drafted now any healthier than those were twenty-two years ago? The answer to this question is one which will be of particular interest to all who have been engaged in student health work and other fields of health education during the past twenty-five years. The high percentage of young men found unfit for military service in 1917 and 1918 gave great impetus to preventive medical work in this country. The development of college health work was greatly stimulated by these findings. Since the majority of physical defects found on the men excluded from army service were preventable in nature, it seemed obvious that with some provision for the early detection of such physical defects and for their correction, it would be possible to prevent such a large proportion of our young people from these physical handicaps.

However uneasy we may be about the world situation and however earnestly we may wish to keep the peace in our country, the physical examination of several million young men offers an unprecedented opportunity to gauge the progress which has been made in health conservation. Incomplete and scattered data for volunteers in the present national crisis indicate that the percentage rejected for physical defects is approximately the same as in 1917 and 1918. The Metropolitan Life Insurance Company thinks, however, that far fewer serious impairments will be found among the young men of 1940 than among those of 1917. Whether or not this is true will only be determined when the results of the physical examinations of large numbers of the drafted men are made available. The progress which has been made in the control of tuberculosis, syphilis, rheumatic heart disease and certain of the communicable diseases which leave disabling sequelae should be re-

*Presidential address, twenty-first annual meeting of the American Student Health Association, Ann Arbor, Michigan, December 27, 1940. Published in the *Journal of the American Medical Association*, February 22, 1941.

†University of Minnesota.

flected in the physical fitness of the present generation of young people.

Although the college group does not represent a true cross section of the young men of draft age, still a college population in a state university can no longer be said to be highly selective. Unemployment among youth today and scholarships and federal aid have put into the college many youths who formerly had no opportunities for higher education. It seemed of interest, therefore, to take a sampling of young men entering a state university and to compare their findings on physical examination with the physical standards of the selective service act.

According to the physical standards under the selective service act, the examinees will be classified into three categories: Class 1A—those physically qualified for general active military service; Class 1B—those who are physically unfit for general active military service but are fit for special and limited military service; Class 4—those physically unfit for any military service. At the present time only men assigned to Class 1A will be inducted into the army. In brief the regulations say:

"The registrant must be able to see well; have comparatively good hearing; have a heart able to withstand the stress of physical exertion; be intelligent enough to understand and execute military maneuvers, obey commands, and protect himself; and be able to transport himself by walking as the exigencies of military life may demand. Examining physicians will accordingly so construe these standards that the objective stated above may be realized."

An unselected sample of 1,000 physical examination records of young men entering the University of Minnesota in the fall of 1939-40 was studied. Of the group of 1,000, 92, or 9.2 per cent, would be assigned to Class 4—those physically unfit for any military service; while 94, or 9.4 per cent, would be assigned to Class 1B—those who are physically unfit for general active military service but are fit for special and limited military service. Thus a total of 18.6 per cent of these University students would be rejected for active military service at the present time. The reasons for the disabilities in this group bear out the prediction of the Metropolitan Life Insurance Company that the majority rejected are due to minor physical disabilities. Of the 92 students whose physical examinations revealed them to be unfit for any military service, 50 were so classed because of underweight, according to the selective service standards. It is possible that a number of these young men would be accepted for military service, as the examining boards have been given a good deal of discretion in matters of height and weight. If, in the opinion of the Board, proper food and training will make a man capable of

giving service he may be inducted into the service. It is probable, also, that this number rejected for underweight is higher than would actually occur in University men of draft age, as the majority of the group was under 21 years of age. Diehl's studies showed that college men increased in weight with age and the percentage of underweight students decreased as the age of the students rose.

The next most common physical defect found in this group was a rapid heart rate. According to the physical standards for selective service, a heart rate of 100 or over per minute, when this is proved to be persistent in the recumbent posture and on observation and re-examination over a sufficient period of time, disqualifies a man for any military service. In the 1,000 University students examined there were 28 who had pulse rates of 100 or over on repeated examinations. In none of these could any organic cause for the tachycardia be found. It is of interest, also, that in this sampling there were no students with organic disease of the heart.

Three of the 1,000 students had visual defects of such severity that they would be excluded from military service. There were two with active pulmonary tuberculosis and two with diabetes, both of which are causes for rejection. One student with duodenal ulcer and one with syphilis are also included in this group. There were only five of the 1,000 with flat feet, which was disabling, and which would therefore put them in the group unfit for any military service. One member of the group was disqualified for any military service because of a severe scoliosis.

In a recent issue of the *Journal of the American Medical Association* there was a report on the physical examination of a group of volunteers in New York. Of those who were rejected for military service, 23 per cent were rejected because of dental defects. It is significant that in this group of entering University students there was not one whose teeth were in such condition that he would be put in Class 4, and only one student who would be classified as 1B. The mouths of all the rest were in such condition that they would have been classified as 1A.

Those students whose physical examinations on entrance to the University were such that, according to the physical standards for selective service, they would fall into Class 1B, as fit for special and limited military service, numbered 94 of the 1,000. The largest percentage of this group was so classified because of nose and throat defects. There were 44 who were classed as 1B, according to the selective service standard, because of nose and throat defects. Seventeen of these had a deviated septum with obstruction to breathing;

15 had severe hay fever; and 12, a chronic sinusitis. Next in importance were defects of hearing. Fourteen of the group had a hearing loss of 50 or more decibels in both ears when tested with the audiometer. The selective service standards do not require the use of the audiometer to determine hearing loss, but rather the spoken voice at 20 feet. Since there have been no standards by which one might translate audiometer readings to compare with the method of testing with the spoken voice, the hearing loss of 50 decibels in both ears has been arbitrarily selected. Using this, however, there were 14 with a hearing loss sufficient to classify them for limited service.

There were 11 who were classified for limited service because of asthma, and 8 because of hernia. Twelve of the group were put into Class 1B because of stuttering. There was only one student who was classed for limited service because of a visual defect. It is obvious that in this group of University students the majority who would be excluded or limited, so far as military service is concerned, would be so classified because of relatively minor physical defects.

Whether these University students are in better physical condition than a true sampling of the general population is not known. The findings in this comparatively small group would indicate that such is the case. While students in a large state university such as the University of Minnesota probably represent a fairly good cross section of the economic and social groups in the area, there is some selection on the basis of intelligence. One would expect this factor of intelligence to have an effect on the health habits and health practices of this group of college students. Not until the results of the examinations of thousands of young men from all sections of the country and from all social, economic, occupational and intellectual levels are available can many questions which come to mind be answered.

Never before have those working in the field of health education and preventive medicine had such an opportunity as the selective service act offers to evaluate the results of public health measures of the past twenty years. Some disappointments may be in store for us, but such scanty preliminary evidence as I have presented indicates that some progress has been made. Likewise such information presents a challenge to all engaged in health work from the elementary school through the college. It seems reasonable to assume that the findings on the physical examinations of young men drafted in 1940 will, as in 1918, cause a renewed interest in preventive medicine and health education and give us valuable information which will guide in the development of the public health program of the future.

Carpal Bone Fractures*

Report of a Case

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TRAUMATIC injuries of the wrist are every-day occurrences, and for the most part are lightly dismissed by the patient as merely sprains. Upon persistence of the symptoms a physician may be consulted. He also occasionally diagnoses the injury as a sprain in spite of definite although obscure roentgenologic evidence of bone injury. The more severe injuries, such as a Colles' fracture or marked fracture and dislocation of a carpal bone, are immediately recognized and treated; but there exists what one might designate as a border-line zone of carpal injuries, which only careful examination and roentgenograms will disclose. These carpal bone injuries are assuming at the present time a position of greater importance to fracture men and industrial surgeons because of the increasing economic losses and compensation problems which they occasion. A report last year of seven such injuries occurring in a group of several industries and temporarily unrecognized led to compensation payments of over \$1,000 for each fracture.¹

These injuries occur chiefly following a fall or blow upon the outstretched arm with the hand in extension. Pain, swelling and disability result, though usually of a less severe degree than in a Colles' fracture. This disability persists. Careful study will then usually reveal a fracture or dislocation of one or more of the carpal bones.^{2,3}

The incidence of these injuries is greater than is generally supposed. Bohler in his clinic⁴ described 437 carpal injuries in six years, compared with 669 Colles' fractures during the same period. Zwerg,^{5,6} in 1938 reported 4,388 fractures from the Koenigsberg Clinic, of which 496 were Colles' fractures and 52 fractures of the navicular and other carpal bones; a percentage of 1.3 of the total number of fractures. A striking similarity is revealed in a recent report of Wilson⁷ of 490 Colles' fractures and 52 carpal bone fractures out of a total of 4,390 fractures treated at the Massachusetts General Hospital.

The average age of patients with carpal injuries is 35 years, these injuries being rare in both childhood and old age.⁸ The incidence of carpal fractures in women compared with that in men is approximately 1 to 17.^{9,10}

In analyzing a series of injuries about the wrist joint,^{2,11} it was found that under the age of 20, when union of the epiphyses takes place, the most frequent injury is a transverse fracture of the radius and ulna about one inch from the lower end of the bone, with backward displacement of both lower fragments. No carpal bone injuries are found in this group. Above the

*From the department of surgery of the Northwest Clinic and Trinity Hospital, Minot, North Dakota.

TABLE I.

	Zwerg	Wilson
Total number fractures reported	4,388	4,390
Colles' fractures reported	496	490
Carpal bone fractures reported	52	52

age of 20, after union of the epiphyses, the most frequent injury is a transverse fracture of the radius alone about one-half inch above the lower end, with posterior displacement and impaction, with or without fracture of the ulnar styloid. In this group are found all the carpal bone injuries.

Among the carpal bone injuries, fracture of the navicular is the most frequent,^{12,13} followed somewhat less often by fracture-dislocation of the lunate bone.¹⁴ Injuries to the remaining carpal bones are far less common, but, nevertheless, require accurate diagnosis and treatment. In Bohler's clinic, of the 437 carpal bone injuries recorded, 234 were fractures of the navicular and 124 were fracture-dislocations of the lunate bone. Wilson reports 36 navicular fractures out of 52 carpal bone injuries, and 11 fracture-dislocations of the lunate bone. As regards the incidence of injuries to each of the carpal bones, the following table presents their occurrence in Bohler's and the Massachusetts General Hospital Clinics:

TABLE II.

	Bohler	Mass. Gen. Hosp.
Fract. navicular	234	36
Fract.-disl. lunate	124	11
Fract. capitate	6	2
Disl. capitate	1	1
Fract. triquetrum	18	1
Fract. hamate	8	1
Fract. trapezoid	13	1
Fract. pisiform	13	1
Fract. ulnar styloid		3
Fract. radial styloid		2

In an exhaustive review of the literature¹⁵ for the five year period 1932-1936, Stack found the following incidence of carpal bone fractures other than navicular and lunate:

TABLE III.

Fract. triquetrum	15
Fract. greater multangular	7
Fract. lesser multangular	1
Fract. hamate	4
Fract. pisiform	3
Fract. capitate	3

Isolated reports of fractures of one or the other of the six carpal bones, excluding the navicular and lunate, are found occasionally in the literature^{16,17,18,19,20,21,22} but as shown above are quite rare. These fractures of the triquetrum and capitate reported have with one exception been associated with crush fractures or fracture of another carpal bone.

The incidence of carpal injuries at the Northwest Clinic over a ten-year period, is as follows:

(1929-1939)		
Colles' Fracture		122
Fract. navicular	4	
Fract. triquetrum	1	
Fract. disl. lunate	1	
*Fract. capitate	1	
Disl. greater multangular	1	
Total of 8		

(*In Trinity Hospital series the only carpal bone injury out of 80 Colles' listed over a 10 year period).

In considering injuries to the wrist joint, one must bear in mind the relationships of the bones, joint spaces, and their coördinated movements.^{23,3} The lower end of the radius articulates with the navicular, lunate and tip of the triquetral bone. The lower end of the ulna articulates with the radius but does not enter into the formation of the wrist joint; it also articulates with a triangular cartilage extending from the radius. The carpal bones are arranged in two rows of four bones each. The upper row consists of the navicular, lunate, triquetrum and pisiform (from radial side out), and the lower row of the greater multangular, lesser multangular, capitate and hamate. The inferior surfaces of the upper row form a cup-shaped articulation which receives the hamate and capitate. The two inner multangulans articulate with the scaphoid, and the pisiform acts practically as a sesamoid bone. Surgically speaking, the lunate acts as the keystone of the arch with support from the navicular. A direct blow on the third metacarpal is obviously transmitted through the capitate, which is the keystone of the lower row. Flexion and extension of the hand take place in the radio-carpal and carpo-metacarpal joints with only slight motion in the intercarpal joint. Radial and ulnar deviation, however, take place only in the distal and proximal joints, but not in the intercarpal articulations.

The mechanics of the production of some of the carpal injuries thus becomes clear.² With the hand in ulnar deviation and extension, a fracture or dislocation of the lunate will result, as the force is transmitted directly to it from the hand through the capitate (fig. 1). If the hand is extended and radially deviated, the navicular slides into the position of the lunate and the force will fracture this bone (fig. 2). Sharper angles of force and a direct fall with the hand extended and the arm outstretched will result in fractures of the other bones on occasion. If the forearm is at an angle of from 45° to 90° with the ground a fracture of the navicular or lunate usually results. In angles greater than 90° the resultant fracture will probably be a Colles'.⁵

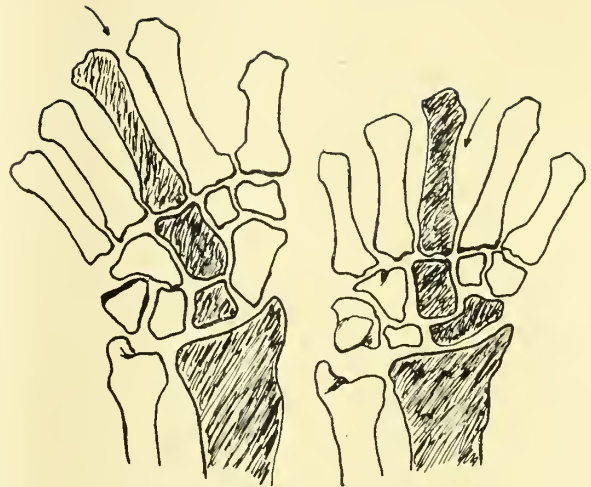


Fig. 1.

Fig. 2.

Diagrammatic view of left wrist illustrating the transmission of force through the third metacarpal capitate and lunate bones to the radius, with hand in ulnar deviation and extension. (Speed)

Diagrammatic view illustrating the transmission of force through the third metacarpal capitate and navicular bones to the radius, with the hand in radial deviation and extension. (Speed)

Because the surfaces of the carpal bones are for the most part articular, the blood supply is poor and in consequence non-union or poor fibrous union is frequently reported.^{24*} These small bones are also peculiarly susceptible to a resultant osteomalacia, which may develop over varying lengths of time. The names—Kienbock's disease (osteomalacia of the lunate), Preiser's disease (osteomalacia of the navicular), etc., are given to specific complications of this type.² It has recently been observed that the use of pneumatic drills and hammers frequently leads to the development of small cysts in the carpal bones.⁵

In the differential diagnosis^{2,3,4,9,10} of traumatic injuries about the wrist, the age and sex of the patient is important, in that 90 per cent of carpal fractures occur in the third and fourth decade. In children, the usual injuries are either epiphyseal or involve both bones of the forearm, and in the older age groups a frank Colles' fracture commonly results. The mechanics of the injury must be determined as accurately as possible. The degree of ulnar or radial flexion, for example, gives a valuable indication as to which of the bones is injured. Generally, pain is the chief symptom of a fracture or dislocation of a carpal bone, the pain being less in fractures than in dislocations. A moderate degree of local swelling is soon apparent; the presence of a generalized swelling indicates a more severe injury, usually a combination of fractures, or a fracture-dislocation. Limitation of motion is a frequent though not an essential accompaniment of carpal injuries; the more extreme degrees of limitation with the hand semi-flexed indicate a volar dislocation or protrusion of a fragment. The ulnar and radial styloids bear their normal relationship and are not tender to touch. Complete loss of function

*The assumption that poor vascular supply influences the degree of union or non-union of the carpals has recently been disputed. (Cited in ^{24,33}).

means a dislocation through a major joint plane, such as the radio-carpal, whereas fractures and dislocations of a single bone (except complete lunate dislocations) give only varying lesser degrees of interference. The point of maximum tenderness indicates the site of fracture. Navicular fractures characteristically show greatest tenderness in the "anatomical snuff box" which also tends to be obliterated by these fractures and by fractures of the capitate. Percussion of the head of the third metacarpal with the hand in radial flexion transmits the jarring force to the navicular bone and exaggerates the pain in the presence of a fracture of this bone. Fracture-dislocations of the lunate have characteristic tender protuberances, either volar or rarely, dorsal. In these injuries occurs the painful, flexion limitation of motion. Fractures of the other carpal bones can only be guessed at by the mechanism of injury and sites of tenderness and deformity. Neither crepitus nor displacement is present very frequently. The position of the hand at the time of injury is the determining factor; for example, the fractures of the navicular in radial deviation and fractures of the triquetrum with the hand in extreme ulnar flexion, the force hitting the volar wrist surface directly.

Confirmation of the diagnosis of carpal bone fracture or dislocation can only be obtained through adequate roentgenograms and the critical interpretation of them. Even after obtaining roentgenograms, the diagnosis of fracture of the carpal bones has not infrequently been missed or misinterpreted. Fractures of the carpal bones, especially the triquetrum and lower row carpal bones, may not be seen in the ordinary anterior posterior and lateral films routinely obtained, and only appear when oblique films are taken at predetermined angles. Comparison films of both wrists should be taken when carpal fracture is suspected but cannot be demonstrated in routine or oblique roentgenograms.^{2,26}

A case well illustrating the obscure nature of these fractures, as well as the resultant disability came to our attention recently:

The patient (H. F., 5872 NWC), a 45-year-old farmer, on the evening of December 26, 1938, tripped and fell to the ground with his right arm extended and the hand in extreme ulnar deviation. The wrist struck the frozen ground directly on the ulnar-volar surface and he immediately felt a sharp, localized pain in that area. There was no limitation of motion or deformity, so in spite of moderate pain on motion, the injury was regarded as a sprain and nothing further done. January 3, 1939, a week later, the pain on motion was still as great and a local lateral swelling was still present, although no crepitus or other deformity had appeared. He was examined at the Northwest Clinic at this time and the positive findings noted were pain on motion, tenderness on the lateral volar surface below the ulnar styloid and a slight swelling. Anterior posterior and lateral roentgenograms were taken, which were interpreted as negative. He was told the injury was likely a rather severe sprain and the wrist taped. A suspicion of a carpal fracture remained so he was warned to return if no relief obtained in the next few days. He returned instead, nine days later with all the previous symptoms and signs; and in addition a definite crepitus and "snap" of a bony fragment on pressure over the ulnar-volar surface. Two oblique views were then taken with the X-ray and a single complete transverse fracture of the triquetrum bone was perfectly apparent. This was confirmed by fluoroscopy. The hand was then dressed in a circular

plaster cast extending to the cubital fossa proximally and to the metacarpal heads, distally, with the hand in a neutral position and the fingers freely movable. This immobilized the wrist completely. He is now doing all his farm work easily with the cast on and no discomfort, although no sign of union is yet apparent at this writing, eight weeks from date of injury.

The treatment of these carpal fractures is complete immobilization of the wrist with freedom of motion of the fingers and elbow.^{2,3,4} This conservative treatment should be given at least four months trial in the opinion of most fracture men^{27,28,29} except in the unusual cases of severe comminution, pre-existing osteoporosis, et cetera. If operation is necessary the method of choice is drilling of the bone fragments through the long axis and insertion of a small bone peg, obtained at the same time from one of the styloid processes.^{29,30} If this fails or is not feasible, removal of the entire bone must be performed. Excision of loose fragments of bone, leaving the remainder of the bone *in situ* only leads to future difficulty.³¹ Many of these patients with fractures of the carpal bones get along well without pain or interference of motion with no signs of bony union ever taking place.^{31,32} Pain and limitation of motion are the only indications for operation in carpal fractures, and then only after the failure of plaster immobilization.

The addition of a dislocation alters the treatment considerably. Some men, such as Bohler and Cotton, make only a half-hearted attempt at reduction and advocate an early, complete operative removal of the offending bone; this radical stand being taken on their own frank, past experience of poor results by the method of closed reduction with manipulation. Others, chiefly Speed, Wilson, Key and Conwell, make three or four attempts at closed reduction by hyperextension of the hand and volar pressure on the bone before resorting to surgery. Still others will replace the dislocated bone by open operation, and recent literature indicates an increasing popularity of this form of treatment.³² The usual treatment is closed reduction by manipulation (several times if necessary), and there are many reduced lunate dislocations with excellent function and no discomfort to testify as to its efficacy. Old dislocated bones are always removed, as reduction of these only leads to later necrosis of the bone. A dorsal incision seems to be preferred, but this point is controversial.^{2,4,32,33} Removal of a carpal bone does not seem to impair to a great degree, if any, later function of the wrist, in spite of conflicting evidence from several clinics. Fractures of all the carpal bones except the navicular respond quite well to conservative treatment. In one of our cases, an isolated fracture of the capitate with no displacement, gave symptoms for three months before subsiding. The navicular bone is notorious for resulting non-union and non-union still occurs in from 20 to 40 per cent of the cases.

CONCLUSIONS

1. Carpal fractures and dislocations are commoner injuries than heretofore believed, and are often missed in examination.
2. Analysis of nearly 8,800 fractures showed 1.2 per cent of them to be fractures involving the carpal bones.

They occur almost entirely in men in the third and fourth decade.

3. Fracture of the navicular bone is the commonest carpal injury, followed by fracture-dislocation of the lunate bone. Fractures of the other carpal bones are quite rare.

4. The surgical anatomy is briefly summarized.

5. In the diagnosis of carpal fractures, pain on motion is usually the chief symptom. The detailed mechanism of injury must be obtained for accurate diagnosis.

6. Usually, oblique roentgenographic films are required to reveal and confirm a carpal fracture diagnosis.

7. A case of a transverse, isolated fracture of the right triquetral bone is presented.

8. In carpal fractures, with rare exceptions, the treatment is immobilization in a neutral position with a plaster cast. Four months trial at least should be given this method.

9. If operation is indicated, the technique of choice is the drilling of fragments in the long axis of the bone and the insertion of a bone peg derived from one of the styloid processes.

10. Pain and interference of motion are the only indications for operation of carpal fractures.

11. In fracture-dislocations or dislocations alone, an attempt is made at closed reductions. If irreducible, or if the injury is old, complete removal of the offending bone is indicated.

12. Non-union of the navicular bone is a frequent occurrence (20 to 40 per cent of scaphoid fractures).

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The Indications for Operative Interference in Obstetrics*

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THE use of operative procedures to overcome or correct complications which occur in obstetrics is fraught with many dangers unless one gives careful consideration to the indications for such procedures. In all conditions where the indications for operative interference are to be considered, one must use common sense and clear thinking in attempting to determine whether or not the procedure to be carried out is justifiable. As progress is made and newer developments are brought forth, we must change our ideas and atti-

tudes to keep pace and adopt those ideas and attitudes which have been crystallized by experience and have been shown to produce the best results.

INDICATIONS FOR THERAPEUTIC ABORTION

The indications for therapeutic abortion may be divided into two groups. The first group includes serious constitutional diseases in the mother which would be unfavorably affected if the pregnancy were allowed to remain. Chronic nephritis and hypertensive disease in the mother may be considered an indication for interruption of a pregnancy. The hazard to the mother in this type of complication is definitely increased; both

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the nephritis and the hypertension are made worse and the chances of survival of the infant are often times quite remote. In the case of hypertensive disease, particularly, the remote mortality is definitely increased if the mother is allowed to continue with her pregnancy.

Advancing Tuberculosis. Recently our ideas have changed regarding tuberculosis in pregnancy. If a pregnant patient with tuberculosis can be treated by bed rest and the ordinary measures which are used for the control of the disease such as pneumothorax or crushing of the phrenic nerve, and if the disease can be controlled by such methods, it does not become an indication for operative interference. If the disease can be controlled during pregnancy, most of these patients will carry through very well. However, with an advancing tuberculosis, in spite of adequate treatment, one has a very definite indication for a therapeutic abortion.

Cardiac Disease with Decompensation. Patients who develop decompensation early in their pregnancy may well be considered candidates for therapeutic abortion. The ordinary cardiac patient may go through a pregnancy easily and very well if she has sufficient intelligence to follow the physician's instructions carefully. She requires a great deal of rest and should be instructed about avoiding exertion, infection, et cetera.

Serious Diabetes. There are two factors involved in a pregnancy complicated by diabetes: (1) whether or not the diabetes can be controlled, and (2) the cooperation of the patient in maintaining the control of the diabetes.

Chorea and Parkinsonian Disease may become indications for therapeutic abortion if the disease is made worse during the early part of the pregnancy.

The second group of indications for therapeutic abortion are those cases in which some pathologic condition associated with, or resulting from the pregnancy is present so that it becomes a direct source of danger to the mother.

Uncontrollable Pernicious Vomiting. The great majority of cases of pernicious vomiting of pregnancy may be treated successfully with the aids which we have available at the present time, particularly if they are seen and treated early. However, if the disease is uncontrollable in spite of adequate treatment, it becomes an indication for therapeutic abortion. In 1932, Stander brought out a time signal for doing a therapeutic abortion on these patients. This consists of examining the eye-grounds routinely every day to watch for retinal hemorrhages. These hemorrhages appear as small pin-point hemorrhages or as a large blotchy hemorrhage and occasionally as a boat-shaped hemorrhage. There are no other findings in the fundi. He has found that if a patient is aborted with the development of these hemorrhages a large percentage will recover. Yet, if they are allowed to go far beyond the development of these hemorrhages the mortality becomes unduly high.

Serious Toxemia. The serious toxemia seen in early pregnancy, besides the pernicious vomiting of pregnancy, is, of course, acute yellow atrophy. This condition is very rare and many men will go through an extensive obstetrical practice and never see a case.

Occasionally a patient is seen during an early pregnancy with a tumor or a carcinoma of the cervix. These bleed quite profusely because of the increased blood supply during pregnancy and because of the increased vascularity peculiar to the tumor itself; it is necessary to interrupt the pregnancy in order to give these patients adequate treatment. The radium and X-ray treatment that is now given for a tumor of this type would, of course, destroy the pregnancy anyway.

In the management of medical complications in pregnancy, it is the wise obstetrician who seeks advice and counsel from the internist. A decision must often be made as to whether the patient will be allowed to continue with her pregnancy, or be aborted if the hazard is deemed too great.

INDICATIONS FOR INDUCTION OF LABOR

The indications for induction of labor may be divided into maternal and fetal indications. The maternal indications include nephritis, advancing vascular hypertension, hyperthyroidism and severe pyelitis. In both nephritis and advancing vascular hypertension the mother's prognosis becomes definitely worse each day that she is allowed to remain in a pregnant state. Both of these conditions are aggravated by pregnancy. In nephritis, the fetus may succumb before term and so it becomes advisable both from the standpoint of the mother and the fetus to induce labor provided the fetus is viable.

Acute Hyperthyroidism during the latter stages of pregnancy is a rather rare complication. If it cannot be controlled by the use of Lugol's solution, then it becomes an indication for the induction of labor provided the fetus is viable.

Traut of New York has shown that there is a factor responsible for the increased severity of *Pyelitis* during pregnancy besides the supposed pressure of the gravid uterus on the ureter at the brim of the pelvis. He has demonstrated that there is a decrease in the peristaltic action of the muscles of the ureter and the kidney pelvis during pregnancy. This occurs long before there is any possibility of pressure from the gravid uterus on the ureters. This decreased peristaltic action may possibly be on a hormonal basis; it has been proved that the peristaltic action returns and the patient is better able to combat the pyelitis as soon as pregnancy is terminated. The mechanical factor of decreased peristaltic action promotes dilatation of the ureter and stagnation of urine in the ureter and kidney pelvis.

In a consideration of the fetal indications for induction of labor one finds that there are certain types of placenta previa and premature separation of the placenta which may become indications for the induction of labor.

Excessive Hydramnion is seen in the last trimester of pregnancy usually. These patients are found to have considerable edema of the lower extremities, excessive weight and complain bitterly about the discomfort which is produced. About 50 per cent of these cases are associated with some anomaly of the fetus. The fetus usually is quite small. One may be justified if he is certain that there is no anomaly, and with a small baby, in withdrawing small amounts of the amniotic fluid by puncture through the abdominal wall. This procedure

must be carried out very carefully, being sure that the bladder is empty and that there are no loops of the small bowel between the abdominal wall and the uterus. It is often necessary that the puncture be repeated at short intervals because of the fact that the fluid reforms quickly. This procedure is justifiable only when the fetus is so small that its chances of survival are remote.

Postmaturity is a definite indication for induction of labor, but many times it is difficult to determine from the dates available in the patient's history whether or not a patient is postmature. The size of the baby is the best index by which to be guided.

The Contraindications for the induction of labor include acute infectious diseases, such as pneumonia and influenza, and moderate degrees of pelvic contraction. The attitude toward moderate degrees of pelvic contraction has changed in the face of improved facilities and procedures for the care of these patients. If facilities are available for hospitalization and operation, it is questionable whether or not moderate degrees of pelvic contraction should become an indication for early induction of labor, because so many of these babies are premature and the fetal mortality rate becomes excessive.

INDICATIONS FOR THE USE OF FORCEPS

The maternal indications for the use of forceps include certain conditions in which it becomes advisable to lessen the physical strain of the second stage of labor because of the increased voluntary effort that is put forth to promote the delivery during this stage. Thus in heart disease, tuberculosis, asthma, nephritic toxemia, and eclampsia, the use of forceps is indicated after complete dilatation of the cervix to lessen the strain of the second stage of labor. It is assumed, of course, that all the prerequisites for the use of forceps have been fulfilled, namely, that the cervix is completely dilated, the bladder and rectum are empty, the membranes have been ruptured, there is a cephalic presentation and the position of the presenting part is accurately known. In some complications of labor, there is exhaustion of the mother with secondary inertia. A few patients are seen in this group who have a primary lack of muscle tone in which they come to complete dilatation due to the effort of the uterine muscle but are unable to exert enough force with the abdominal muscles to conclude the second stage of labor. This is usually a flabby type of individual, with very little or poor muscular development.

Moderate disproportion between the size of the head and the pelvis may become an indication for the use of forceps to prevent a long and difficult labor which would decrease the chances of survival of the fetus.

In *Malpresentation*, such as occiput posterior position, or transverse arrest in the mid-pelvis, one may have an indication for the use of forceps. If these complications do not correct themselves within a reasonable period of time after complete dilatation of the cervix, one is justified in using manual rotation or forceps to correct the malpresentation. In occiput posterior position it matters little whether one uses Kielland forceps or the Scanzoni maneuver. The important point here is to use one type of forceps and become adept in its use. De Lee has

advocated the use of prophylactic forceps with episiotomy after one and one-half to two hours of the second stage of labor if the head is low in the pelvis. There are definite advantages in this type of procedure. In the first place, it saves the mother's tissues in that the fascia and muscles of the perineum are prevented from tearing or rupturing and the patient will get a much better result if an episiotomy is made and a good repair obtained. The second point which De Lee brings out is that the prolonged second stage labor increases the amount and frequency of cerebral hemorrhages in the baby's brain.

It is readily admitted that *Excessive Analgesics* make the use of forceps necessary in a high percentage of cases. The trend is definitely away from the use of excessive amounts of analgesics in obstetrics. There has been considerable pressure brought to bear on the medical profession by the appearance of various publications in lay magazines and the press, and patients often come in expecting and demanding certain types of analgesics. The mother should be made to understand that there are certain dangers inherent in excessive doses of analgesics both for herself and for her baby. If these patients are told that they will be given analgesics consistent with safety, most of them will be reasonable and more easily handled.

The Fetal Indications for the Use of Forceps include changes in the rate and regularity of the heart beat. If one has determined the normal variation in the heart during a contraction and in the interval between contractions, then one may assume that any rate above or below that normal variation, particularly if the change in rate is sustained, is an indication of fetal distress, and the use of forceps may be indicated provided all the prerequisites have been fulfilled. The passage of meconium in a cephalic presentation is often an indication of fetal distress, and may indicate the use of forceps.

INDICATIONS FOR VERSION AND EXTRACTION

The indications for version and extraction fortunately are becoming fewer in number. There still are certain complications of labor in which it is advisable to do a version and extraction, either from the standpoint of the mother or of the fetus. These indications include a transverse or oblique presentation which cannot be corrected by external manipulation; a face or brow presentation which cannot be corrected by manipulation under anesthesia; a few occiput posterior presentations, particularly the type in which it is difficult or impossible to make a satisfactory application of the forceps to carry out the rotation; prolapse of the arm and prolapse of the cord are definite indications for the use of version and extraction. The trend is away from the use of version and extraction in placenta previa. There are other methods of delivery which produce much better results both from the standpoint of the mother and the fetus. Version carries a higher maternal as well as fetal mortality and much injury may be done to the cervix which is often quite friable.

Although one cannot agree with the indications which Potter has adopted for the use of version, one must admit that Potter has taught the American obstetrician the technic of doing a version.

INDICATIONS FOR CESAREAN SECTION

Due to perfection of surgical technic in the past few decades, there has developed a false sense of security in a cesarean section operation. The indications have been widened to keep pace with this progress in surgical development to the point where almost any obstetrical complication which is not readily corrected becomes an indication for an abdominal section. Williams and Stander, as well as many other writers, are of the opinion that there are too many cesarean sections performed for insufficient indications. An operation which carries a mortality of 4.1 per cent as shown by Lynch in a recent survey, must be given due consideration and rigid limitation. The indications for cesarean section are considered as absolute or relative. The absolute indication is one in which a living fetus cannot be delivered through the birth canal, while the relative indication is one in which the fetus may be delivered through the birth canal but its chances of survival, as well as those of its mother, are increased when cesarean section is performed.

Disproportion. A contracted or deformed pelvis in which either the inlet or the outlet is so small as to prevent the delivery through the birth canal is an absolute indication for cesarean section. There is much variation in the size of pelvis as well as in the size of passengers, and one must exercise judgment in determining whether or not delivery is possible through the birth canal. The cases of disproportion in which the indication is not definite should all have a real test of labor before abdominal delivery is decided upon.

Hemorrhagic States. This group includes placenta previa, premature separation of the placenta and ruptured uterus. They are composed of conditions in which the blood loss may be great, thereby increasing the hazard both to the mother and child. The trend is toward the more liberal use of cesarean section in the treatment of these complications. Various statistics show that the maternal and fetal mortality are reduced when cases of placenta previa with severe hemorrhage, undilated cervix are treated by cesarean section. A placenta previa, premature separation of the placenta, and a ruptured uterus may bleed so severely as to indicate abdominal delivery in spite of the fact that the fetus is dead. In premature separation of the placenta, and ruptured uterus, it may also be necessary to do a hysterectomy.

Obstructing Lesions. This group includes tumors in the lower uterine segment, previous high cervical amputations, acute edema of the vulva, and a rigid cervix in elderly nullipara. The tumors are usually either fibroid in the lower uterine segment or ovarian tumors such as dermoids which are impacted in the pelvis. One is often surprised at the change in position of the fibroid during the first stage of labor as the lower uterine segment is thinned out and pulled upward over the presenting part. In elderly nullipara one occasionally encounters a rigid cervix which will not thin out or dilate readily. While there is much difference of opinion as to the procedure to be followed, most obstetricians are agreed that a test of labor should be allowed and continued as long as there are no indications of maternal or fetal distress. Many of these patients will deliver

normally if given a chance. It is important to conduct the labor in such a manner that an abdominal hysterectomy does not become contraindicated.

Previous Dystocia. These are the patients who come to the physician with a history of having had two or three previous difficult labors and still are childless. They should have the benefit of delivery by cesarean section. The X-ray study of the bony pelvis such as has been carried out by Thoms, Caldwell and Malloy and others may be expected to give us more information in the future regarding cases of this type.

Previous Cesarean Section. "Once a cesarean always a cesarean" is not an absolute dictum unless the operation has been performed for an absolute indication. The previous indication may not be present during a subsequent pregnancy. If the puerperium following the first section was afebrile and there is every reason to believe that there was good healing of the uterine wall, particularly if the patient had a low cervical cesarean section, she may be allowed to go into labor, but should be watched closely in a hospital, and immediate operation carried out if weakness or rupture of the uterine scar becomes apparent.

Malposition. Abnormal positions of the fetus and presenting parts occasionally indicate interference in the form of abdominal delivery. Transverse position which cannot be corrected, a brow or face presentation often causes a difficult prolonged labor with considerable danger to the child. Each case must be judged on its own merits, but a fundamental knowledge and skill in obstetrical procedures will overcome or correct many of these malpositions without resorting to radical operative measures.

Medical Complications. Heart disease and tuberculosis are rarely justifiable indications for cesarean section. Proper treatment with the assistance of a competent internist during the pregnancy is of primary importance. Forceps delivery as soon as dilatation is complete will conserve the patient's energy by avoiding the expulsive efforts during the second stage of labor. Patients with severe cardiac disease who are not decompensated make up a small group of patients in which one may be justified in doing an elective cesarean section, preferably under local anesthesia.

In diabetes, the work of Priscilla White and her co-workers has demonstrated that the use of cesarean section has not overcome the high fetal mortality. Her recent work indicates that better results are obtained in pregnant diabetics by studying the serum prolan concentration and administering estrogenic and corpus luteum hormones to bring the serum prolan value within normal limits.

Toxemias. Eclampsia is not an indication for cesarean section. Eclamptic patients do not tolerate shock. Statistics have proved repeatedly that better results are obtained by conservative measures. Non-convulsive toxemias which do not respond to treatment and are fulminating in character may be considered as proper indications. Cesarean section is best performed under local block anesthesia.

The Problem of Essential Hypertension*

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MY discussion of "The Problem of Essential Hypertension" will be prefaced with a few remarks on the physiologic dynamics which regulate normal *arterial* pressure.

In a normal individual the blood propelled from the heart with each systolic contraction of the left ventricle exerts *pressure* upon the elastic blood vessels (aorta, arteries and arterioles) through which it flows. These elastic arterial vessels stretch with each systolic thrust, and then contract (recoil) when the thrust has passed on. By such a process of expansion and contraction the blood finally reaches the arterioles which are the smallest arteries having a muscular coat (the media) and are precapillary in position.

The purpose of the arterioles is to "step-down" the normal blood pressure (of 100 mm. at the beginning of the arterioles) to 20 mm. at the beginning of the capillaries. The capillaries are thin-walled vessels lacking a muscular coat and have but little resistance (i. e. 20 mm.) to changes in blood pressure behind them. Their sole function is to convey nutriment to the tissue cells. The arterioles, therefore, have the function of regulating blood flow to the capillaries by dilating or contracting.

The arterioles have a middle coat of smooth muscle, and like all smooth muscle, are in a constant state of "tone" peculiar to their respective needs. In addition they are supplied with vasomotor fibres. There is a vasoconstrictor center in the mid brain and a vasodilator center in the floor of the fourth ventricle. The vasoconstrictor nerves have subordinate relay centers in the white rami forming the spinal sympathetic system. These extend from the first or second thoracic to the fourth or fifth lumbar segments inclusive. These vasoconstrictor nerve fibres are distributed to all parts of the body, even to the head and limbs.

The kidneys are supplied by fibres from the sixth to thirteenth thoracic segments. The pathways of the vasodilators are not clearly defined. Reflex vasoconstriction or dilatation might each be produced in two ways: (1) By excitation of the constrictors or by inhibition of the "tone" in the dilator center. (2) By excitation of the dilator center or inhibition of the constrictor center.

Also metabolites might be formed as a result of cellular activity that would alter tissue tone. Both lactic acid and CO₂ decrease muscle tone while oxygen increases it. According to Bayliss the blood flow through an organ in a state of activity is increased in the following number of ways: (1) By a rise in the general arterial pressure produced by vasoconstriction in other parts. (2) By vascular dilatation in the organ itself, the general arterial pressure remaining unchanged. (3) By the production of acid metabolites through cellular activity.

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The natural tonus in the arterioles is maintained in three, perhaps four ways: (1) By the natural property of smooth muscle to be in a state of partial tonus; (2) by continuous vasoconstrictor impulses sent out by tonic excitation of the vasoconstrictor center; (3) by the contraction set up by adrenalin in those arterioles supplied with sympathetic nerves, when this substance is in the blood (fear, anxiety. C.N.H.); (4) by the contraction with which they respond to the normal stretching force of the blood pressure. Possibly?

From the foregoing statements it is obvious that in health, arterial blood pressure is maintained at the normal level by the automatic balance between a number of forces, chemical, neural, tonal (muscle). Normal arterial blood pressure may be said to be the result of cardiac output, peripheral resistance (arteriolar) and arteriolar tonus.

In states of hypertension it has been surmised that at the onset the peripheral resistance has been increased by spastic constriction of the arterioles in a large area; i. e., possibly the splanchnic area, with the result that the heart must beat with greater force to overcome this resistance; the result is a rise in blood pressure.

If the elevation in blood pressure continues, conceivably, the tonus of the arterioles would increase and the heart muscle would have to hypertrophy in order to be capable of maintaining an elevated blood pressure.

Apparently in the earlier stages of hypertension, nature makes these automatic adjustments so gradually and effectively that the individual is unaware of his altered cardiovascular condition until accidentally, perhaps at a life insurance examination, or through a health examination, the sphygmomanometer reveals an elevated systolic blood pressure of 160 to 200 mm. At this stage the individual may be without symptoms or other signs. The heart may be normal in size, the urine free from albumin and casts and the blood metabolites, urea and chlorides at normal levels.

The elevation of arterial pressure may become arrested at this level and the patient may live for years, especially if the diastolic pressure remains relatively low. Or the arterial pressure may continue to rise; but, as long as the heart remains competent and is able to counteract the arterial resistance in front of it, symptoms are minimal or absent. Eventually the individual begins to complain of subjective symptoms, i. e., dizziness, headache, ringing in the ears, palpitation, slight dyspnea on effort, a sense of weight in the chest, nose bleed, and mental irritability.

Naturally these symptoms need not all be present, only one or two may be noted and the patient may ignore them. So too, the physician, especially if the individual is nervous and irritable, may overlook the significance of these symptoms and treat the patient symptomatically without making an examination. Eventually

such patients come under observation with obviously severe symptoms, notably cardiac, cerebral or gastric. The cardiac symptoms will be those of beginning congestive heart failure; subjectively, dyspnea; objectively, peripheral edema of ankles and shins, congestive rales at the lung bases posteriorly, or unilateral hydrothorax, usually on the right side; less commonly attacks of acute pulmonary edema at night; symptoms of air hunger, a sense of suffocation, deep cyanosis, and even a fear of impending death may be added to the picture of advanced congestive heart failure.

The patient may give a history of previous attacks of angina pectoris, or of an attack of coronary occlusion preceding the onset of the above serious symptoms. If a patient presenting such symptoms is carefully examined, the following conditions will be found: (1) High systolic pressure with relatively low diastolic level. (2) Both systolic and diastolic levels markedly elevated. (3) Enlargement of the heart. (4) Accentuated aortic second tone, often ringing in character. (5) A systolic murmur over the aortic region. (6) A systolic murmur over the apex of the heart. (7) Rales at lung bases. (8) Fluid in right chest. (9) Edema of the shins. (10) Changes in retinal blood vessels. E.K.G.: Left axis deviation marked, widening Q.R.S. beyond 0.1, T₁ inverted or diphasic, T₃ inverted. One or more of the above alterations are usually present.

Cerebral Symptoms. These may be transient and appear as hemiplegias, aphasias, monoplegias, due to angiospastic conditions in the cerebral blood vessels which may disappear in 12 to 36 hours. Generalized convulsions may appear in the absence of kidney changes or signs of uremia. Such convulsions may be precipitated by sudden rises in systolic blood pressure up to 300 mm. Sometimes the cerebral vessels rupture and apoplexy results.

Gastric Symptoms. These are frequently present and are merely signs of a failing myocardium. There may be a sense of fulness in the abdomen, bloating, and gaseous distension.

Kidney Symptoms. These are uncommon. In the early stages there may be only a small amount of albumin. In the late stages the kidney signs are associated with congestive heart failure such as a cloud of albumin in the urine, casts, and red blood in the sediment, and a rise in the blood urea nitrogen.

Having thus far dealt with the physiologic dynamics, normal and hypertensive, and described the various stages of a typical case, let us now consider the etiology of the disease and various extraneous contributing factors.

VARIOUS TYPES OF HYPERTENSION

1. Primary or Essential Hypertension. (a) Benign. (b) Malignant.
2. Chronic Glomerular Nephritis.
3. Secondary Hypertension. (a) Aortic insufficiency; (b) heart block; (c) coarctation of the aorta; (d) adrenal tumors; (e) hyperthyroidism; (f) pregnancy; (g) enlarged prostate with hydronephrosis.

Essential hypertension is the most important type and will be the only type dealt with in this paper. Bell has

estimated it to be responsible for at least 15 per cent of all deaths after the age of 50 years.

DEFINITION

"Essential hypertension is a functional disorder (the cause of which is unknown) characterized by a progressively increasing elevation of both systolic and diastolic blood pressure; the mechanical strain of the high arterial tension produces changes in the heart and in the arteries, especially the arteries of the heart, brain, and kidneys, often with fatal result."—(Mosenthal).

AGE

While an occasional patient is encountered with essential hypertension under 30 years of age, the vast majority of the clinical manifestations of the disease first appear between 40 and 50 years.

SEX

While medical opinion seems to be somewhat divided, it appears that males predominate before the age of 45 to 50 years; after that, due to endocrine factors, females are equally or more frequently affected.

HEREDITY

There is a distinct tendency for essential hypertension to be transmitted from one generation to the next. In its inheritance it follows the Mendelian law and is a dominant characteristic.

Hines² used the "cold pressor" test in a study of the hereditary factor in vasomotor reactivity and essential hypertension. *Technic:* The subject rests in a quiet room for 20 to 60 minutes, during which several blood pressure readings are taken until a basal level is approximated. The cuff of the sphygmomanometer is placed on one arm and the hand is placed in ice water 4° C. (39° F.) to just above the wrist. Blood pressure readings are taken in 30 and again in 60 seconds; the maximal reading is the index of response. The hand is now taken from the ice water and blood pressure readings are thereafter taken every two minutes until the pressure returns to its previous level, which return occurs in persons with normal pressure within two minutes. The return is delayed in persons with essential hypertension.

All persons tested fall into one of two groups: (1) normal reactors, and (2) abnormal or hyper-reactors. Observations were carried out along three lines: (1) Correlation of *type* of reaction to the test, and the incidence of hypertensive disease in the family history. (2) A study of the reaction of twins to the test. (3) A study of the reaction of members of hypertensive families and of non-hypertensive families to the test.

(1) A study of the family history of 608 persons who had a normal blood pressure and of 267 cases of essential hypertension showed that a *positive family history of hypertensive cardiovascular disease is five times as frequent among persons who have hypertension, or who are hyper-reactors to the test, than it is among those who react normally to the test.*

(2) Ten sets of twins were studied. In seven sets of identical twins, the response of one twin was similar to that of the other, whereas, in two of the three sets of fraternal twins, the response was different.

(3) Thirty families consisting of 256 members were studied. In 12 families there was no evidence or history of hypertensive cardiovascular disease; in 18, there was a definite hypertensive diathesis. Tests were done on all living members. When both parents had normal blood pressure and were normal reactors, *all* the children were normal reactors.

If both parents were hyper-reactors or had hypertension, 95 per cent of the children reacted similarly; if but one parent had hypertension or was a hyper-reactor and the other parent was a normal reactor, then 43.4 per cent of the children were hyper-reactors or had hypertension.

In three families of two generations, the parents had essential hypertension or had died of it, and *all* the children had hypertension or were hyper-reactors.

These findings present strong evidence of the importance of the hereditary factor in the development of essential hypertension. The inherited quality may be a vasomotor system which reacts excessively to certain external and internal stimuli. This tendency may eventually cause hypertension in many cases.

RACE

Certain races do not seem to be susceptible to essential hypertension. This is especially true of the Chinese. Foster³ noted that in the Hunan-Yale Hospital at Changsha, China, where more than 4,000 patients had been admitted to the medical service during the preceding four years, there was only one patient diagnosed as having essential hypertension. Also in the same hospital, taking the cases of nephritis and heart disease, not more than 20 patients had a systolic blood pressure over 160 mm. Foster comments that during the years 1918 and 1919, of 4,940 patients in the medical wards of the Peter Bent Brigham Hospital in Boston, there were 236 cases diagnosed essential hypertension, and 146 cases diagnosed nephritis with hypertension.

Studies on blood pressure in India seem to show that the average systolic pressure of the Hindus is about 100 mm., while that of Europeans in Bengal is from 115 to 130 mm. systolic. Chamberlain in 1912 (quoted by Foster) as the head of the army board appointed to investigate tropical diseases in the Philippines, after a careful study of more than 6,000 observations on the blood pressure of 1,042 American soldiers and 500 observations on 386 Filipino soldiers, concluded that "The blood pressure of Americans residing in the Philippines differs but little from the average at home (average 115 mm. for 18 to 30 years; 118 mm. for over 30 years). Also there did not appear a tendency for the blood pressure to rise or fall with increasing length of residence (up to three years), the limit of the study." He found that the average pressure for the Filipinos was practically identical with that for the group of white men (i. e., 116 mm. for 15 to 40 years of age.)

Jarvis-Nye⁴ reported on the study of the blood pressures of an aboriginal tribe of Australians. There were 103 patients, 63 males, and 40 females. Among these people there were grandparents, great-grandparents, and great-great-grandparents. The constant finding of a low tension pulse and soft arteries was striking. The

highest systolic pressure recorded was 188 mm., and the highest diastolic pressure was 88 mm.

This study of Jarvis-Nye tends to show that raised blood pressure and vascular sclerosis were entirely absent in this group, and suggests therefore, that raised arterial blood pressure is not a normal accompaniment of senescence. His findings are also surprising, since the diet of these people was almost entirely carnivorous. These people live in a state of communism, in which food and possessions, joys and sorrows are shared by the whole tribe. Among these people there exists none of our own civilization's selfishness which causes us much stress and strain, both mental and physical. Furthermore, these people have remarkable powers of endurance.

Ismail⁵ of Cairo, Egypt, reports on the study of the blood pressures of 3,000 Egyptians, many of whom were observed for 10 to 15 years. All were seen in private practice. He concludes that chronic primary hyperpiesis (essential hypertension) is quite common in Egypt and accounts for at least 10 per cent of all patients seen in private practice. The disease seems to be limited to the years 35 to 55.

BODILY HABITUS OR CONSTITUTIONAL TYPE

Essential hypertension seems to be prone to develop in individuals of the "sthenic" habitus; i. e., those with a heavy skeletal frame and good muscular development. However, one should not overlook the fact that it can, and does, develop in the tall, slender, "greyhound" type of body build, and occasionally it will appear in the slightly built individual with a small bony framework, small muscles, and a small centrally-placed heart; i. e., the "asthenic" build.

THE MENOPAUSE

As mentioned earlier, rises of blood pressure tend to appear in women at the menopause. Sometimes there are wide fluctuations in the patient's nervous reactions and blood pressure readings. Fortunately, in the majority of women, with the lapse of time, there comes an adjustment of their adreno-sympathetic nervous system to the lack of ovarian secretion; eventually a state of calm returns and these women settle down to a serene middle age.

In a certain proportion of such women, the blood pressure tends to rise to systolic levels of 200 to 240 mm. and remains elevated. But the diastolic pressures are not proportionately raised, averaging readings of 90 to 110 mm. In these women, such a type of elevated systolic blood pressures seems to be relatively benign. I have observed a number of such patients for from 10 to 15 years, and many bear these high systolic pressures remarkably well. They are usually of the obese, sluggish type, look myxedematous, and often have heart rates of 60 beats per minute. It is possible that during sleep their systolic blood pressure drops appreciably.

Occasionally, I have encountered women at the menopause with systolic readings of 180 to 200 mm. who appear nervous and irritable and complain of mild precordial pain or a dull ache over the heart; often they are greatly bothered with hot flushes. Hypodermic injections of theelin, 2,000 to 10,000 international units

intramuscularly, two to three times a week, will sometimes restore their blood pressures to normal levels.

I have treated one such patient for a period of over three years. The first systolic blood pressure was 200 mm.; after three months' treatment with theelin, it was 140 mm. Since that time whenever her systolic blood pressure rises to about 160 mm., pre-cordial ache appears causing her to return for more treatment.

OBESITY

The role of obesity in relationship to essential hypertension is hard to assay. We know that many obese people have normal blood pressures. Terry,⁶ in the Obesity Clinic for Women of the Presbyterian Hospital, found that the average age of patients applying for treatment was 45 years, and the average weight was 200 pounds, and that 58 per cent had essential hypertension. Weight reduction seemed to effect a drop in blood pressure.

There is another angle to the factor of obesity in essential hypertension. Willius has demonstrated a greatly increased capillary bed in obesity which he believes adds greatly to the work of the heart. Since essential hypertension of itself increases the work of the heart, the presence of obesity would serve as an additional load. Weight reduction might reduce this load, and should, therefore, be advised.

In this connection, I recall the visit to the United States in 1928, of Julius Bauer (then professor of endocrinology at the University of Vienna). In his talk before the Minnesota Pathological Society on "The Problem of Obesity", he stated that it was his belief that the obese individual had not only a "lipophilia"; i. e., a tendency to store fat, but also a "chloridophilia"; a tendency to store salt in the tissues, plus a "hydrophilia"; i. e., a tendency to store water in the tissues. He attributed the failure of some obesity cures to effect weight reduction to the failure to restrict water and salt, in addition to reduction of total calories and fats.

MEAT PROTEIN

For many years it was believed that essential hypertension was associated with primary disease of the kidneys, and that the over-eating of protein food, notably the protein of red meat, would aggravate the condition of the kidneys and increase the hypertension. So strong was this belief that for many years all patients with hypertension, even those showing no evidence of renal insufficiency, were put on a diet restricted in protein and were forbidden red meats.

In 1919, Newburgh and his associates made a study of the effect on the kidneys of high meat protein diets. Using rabbits for their experiments, they found quite generally that these experimental rabbits showed sclerotic vascular renal changes. Since rabbits are herbivorous in their eating habits, a meat protein diet is unnatural for them, and Newburgh's deductions would not be applicable to man.

However, the question was settled in a way, when in 1929, Lieb published the results of his studies on Valdimir Stefansson (the Arctic explorer) who had spent the better part of a decade at different times, in the Arctic. While there, he lived on an exclusive meat diet. For one continuous period of nine months he ate

nothing but meat alone. Yet Lieb found Stefansson to be in perfect physical condition, heart, blood, blood chemistry, and urine were normal, and his systolic blood pressure was 115/55.

In Stefansson's diary, we find his personal notes concerning that one long period where he subsisted on meat alone for a period of nine months; I quote from memory: "Never in my life have I felt better physically, had more normal digestion, better bowel elimination, nor had a better mental capacity to think out and do the things I wanted to do."

SALT

The causal relationship between the intake of sodium chloride and essential hypertension, though occasionally discussed by various writers, was not greatly stressed till Allen and Sherrill, in 1922, published their study of 180 cases of severe hypertension (many observed as long as four years), treated by the most rigid elimination of salt and salty foods from the diet. Their results were: "Systolic blood pressures were reduced to normal in a small minority (34 cases—18.9 per cent). In 75 other cases (41 per cent) the reduction of the systolic blood pressure and the relief of disturbing symptoms, was so effective that the patients became subjectively well and remained so. In other words a total of nearly 60 per cent of the patients showed a striking success. In 16 other cases (8.9 per cent) there was a partial or transitory benefit. In 55 cases (30.5 per cent) complete failure was acknowledged; i. e., because there was no perceptible improvement beyond what might be attributed to rest and other routine measures. The total mortality for the four years was 25, or 13.8 per cent."

In 1925, Allen⁷ published a monograph on "Diseases of the Kidneys and High Blood Pressure," in which he reiterated his belief in the salt restriction principle and added another 148 cases. He states as his continued belief that: "The systolic blood pressure in these cases was regularly above 190 mm. and generally well above 200 mm. The percentages of success and failure remain practically the same; the progressiveness of the hypertension (the worst element in the prognosis) has been arrested in the successful cases."

A salt-free diet according to Allen, means that no salt should be added to the diet either at table or in the cooking, and that, furthermore, foods should be chosen from among those lowest in natural salt content. The following foods should be avoided: bacon, ham, corned beef, smoked tongue, salt or dried fish (codfish, etc.) as well as all kinds of smoked and preserved meats. Most commercial cheese is heavily salted and is to be avoided. Fresh cottage cheese and cream cheese may be allowed. Baker's bread and all cake and pastry contain salt and are to be avoided. Prepared cereals (i. e., corn flakes, etc.) and some canned fruits and vegetables contain salt. Table sugar is salt-free, but most kinds of molasses and syrup contain too much salt to be used.

Ordinary salted butter is to be avoided, but unsalted butter, lard, crisco, and every kind of oil are permitted. The use of shell fish is best limited to those obtained from fresh water. (Note: Salt water fish do not absorb salt from sea water and, therefore, can be used). Fruits

and nuts (unsalted) are allowed, but contain sufficient salt (especially bananas) to be used sparingly. Milk should be used sparingly because of its salt content, but cream may be allowed. Soups are permissible if made without salt (exclude all canned soups because they are apt to be salty). The making of a salt-free soup, that tastes good, is a test of cooking skill. Vegetables contain an appreciable amount of salt in their natural state; therefore, use some raw as in salads; the rest cook in three changes of water, to reduce their salt content.

Sodium bicarbonate is less injurious to the kidneys than is sodium chloride, but is convertible into the chloride by the gastric juice, and the production of edema by sodium bicarbonate has been known for some time. The evidence for sodium bicarbonate producing hypertension is not conclusive, but Allen thinks it may aggravate the hypertension, and, therefore, advises the stopping of the habit of daily self-dosing with alkalis.

Iodides and bromides are known to be to some extent, at least, interchangeable with chlorides. On a salt-poor diet they may replace a considerable part of the chloride in the body which passes off in the urine, leaving the bromine or iodine mixed with the remaining chloride in the tissues.

The Lag in Chloride Elimination. When a patient is placed, suddenly, on a salt-free diet, the excess chlorides retained in the tissues are more or less rapidly eliminated. But the elimination of edema and its salts sometimes extends over many weeks.

Sometimes a hypertension patient who was supposed to have little or no edema reveals a surprising salt retention, and this salt may be eliminated rapidly within a few days; or, on the other hand, more slowly in fractional daily amounts. (Note: Some salt is eliminated through skin and bowel).

In the majority of patients, withdrawal of sufficient salt from the diet, so as to reduce the salt content of the 24-hour urine to 0.2 to 0.5 grams, can be endured indefinitely without harm.

Salt-deficiency Symptoms. A small minority of patients will develop typical and serious symptoms on such a salt restriction. The first symptoms are marked weakness and loss of appetite. Within one to two days there may be marked prostration, anorexia, nausea, perhaps vomiting, plus severe headache and pain in the calves of the legs, while the heart action may be weak and irregular. Any doubt about the diagnosis of salt restriction can be settled by giving two grams of sodium chloride in soup or plain water. The true symptoms are cleared up like magic in a few hours or within 24 hours. If the symptoms persist, they are due to other causes.

Following the publication of Allen's studies, considerable controversy arose as to the value of salt restriction in essential hypertension. Some observers supported Allen while others claimed that the treatment was useless. As for myself, I have found Allen's method helpful sufficiently often so that I continue to give each new patient with essential hypertension the benefit of a trial on this type of management.

VARIABILITY OF BLOOD PRESSURE

It appears to be a fact that blood pressure in practically all people varies greatly from hour to hour and day to day. Such variations have been called "spontaneous variations", and are to be borne in mind when considering a diagnosis of hypertension.

It is often necessary to make repeated observations on succeeding days or weeks before one can determine the general level of blood pressure. It seems that patients with essential hypertension tend to exhibit wider fluctuations than those with normal pressures. Patients are often apprehensive at the time of the first examination and may show readings above their habitual average. A word of reassurance and the advice, "to relax" or "to take a few deep breaths" (which latter procedure will divert the patient's mind momentarily from the process of blood pressure taking) will often show a drop of 10 to 20 mm. systolic when the pressure is immediately retaken. Such a sudden drop is suggestive that the first elevation was due to nervous tension and may, therefore, be of less significance than at first appeared.

Because of such "often found" types of variations in successive readings, it has been my custom to take all blood pressure readings with the patient recumbent; it seems to be easier to get a patient to relax in this position.

Inquiry should be made into any possible factors of emotional stress or nervous tension in the patient's family life or business relationships.

THE FACTOR OF REST

Rest in bed often has a marked lowering effect on blood pressure. But bodily repose alone, unless accompanied by mental calm, may not produce a drop in elevated blood pressure. Sleep in itself, possibly through its relaxing effect on arteriolar tone, seems to exert a definite lowering effect on blood pressure.

Muller,⁸ in the year 1921, made a series of studies on the blood pressures of sleeping subjects, in three groups of people: (1) On normal subjects of all ages. (2) On 27 patients with high blood pressure. (3) On 18 patients with chronic glomerular nephritis.

He observed that during sleep the normal male had an average systolic pressure of 94 mm., while the normal female had an average systolic pressure of 88 mm. He concluded that a systolic pressure in sleep 15 mm. above these levels, indicated pathological conditions. Sleep appeared to erase the individual differences and spontaneous variations observed during the day.

He observed that in patients after 45 years of age, there was a general tendency for the systolic pressure to rise during sleep, but he noted the fact that many elderly subjects had normal systolic pressures during sleep. This observation suggests that age alone does not necessarily raise the level of the systolic blood pressure. (Note: The subjects were given moderate doses of barbital to secure sound sleep).

Addis,⁹ in the year 1922, published the results of his studies on the question of normal blood pressure and pulse rates under varying conditions. His observations were made on soldiers at Camp Lewis, Washington, dur-

ing the last "Great War" under what he calls "basal" and "daytime" conditions.

The term "basal" he reserved for those observations made on soldiers early in the morning while they were still in bed (after a night's sleep) and before they had risen from bed or partaken of breakfast. The term "daytime" measurements applied to observations made at various times during the day after the subjects had risen from bed and partaken of food, but before the subject had performed any degree of muscular work.

In both the "basal" and "daytime" studies, the blood pressures were recorded with the patient "lying down".

The results of his observations are revealed in the following tables and are worth considering:

TABLE I.
"Basal" measurements on 76 normals. "Daytime" measurements on 300 normals.

AVERAGES				
	Systolic	Diastolic	Pulse Pressure	Pulse Rate
Basal	99 mm.	77 mm.	28 mm.	63 per min.
Daytime	127 mm.	78 mm.	50 mm.	80 per min.

COMMENT

Since the systolic blood pressure, other things being equal, is determined by the amount of blood being pumped out of the heart at each systole, we may assume, therefore, that the "daytime" rise in systolic blood pressure indicates an increased output at each beat and, therefore, more heart work.

TABLE II.
The effect of exercise on 10 apparently normal individuals under varying conditions.

Conditions	Systolic	Diastolic	Pulse Pressure	Pulse Rate
"Basal"	100 mm.	65 mm.	35 mm.	60 per min.
"Daytime"	121 mm.	77 mm.	44 mm.	74 per min.
Short Exercise	137 mm.	59 mm.	78 mm.	81 per min.
Longer Exercise	168 mm.	42 mm.	126 mm.	114 per min.

If such elevations occur in the systolic blood pressure levels after varying degrees of exercise in a group of normal young men, it is obvious that we must observe our cases of essential hypertension before and after exercise, and, therefrom, decide what type and what duration of exercise is best suited to their particular problem.

TABLE III.
The effect of excitement on the "daytime" blood pressure levels of two groups of 27 men.

"DAYTIME" CONDITIONS				
	Systolic	Diastolic	Pulse Pressure	Pulse Rate
Those with no excitement—27 men	122 mm.	79 mm.	43 mm.	80 per min.
Those excited—27 men	154 mm.	89 mm.	65 mm.	92 per min.

In the 27 men, the first group admitted that they were not excited by the examination. In the second group of 27 men, they admitted that they were excited

about the examination because they feared such an examination might disclose something that would be found which would prevent them from going overseas with their regiments. Such studies reproduce similar apprehensions in many patients who consult doctors in private practice, and, therefore, such blood pressure readings should be taken *cum granum salis*.

HYPERTENSION IN YOUNG MEN

Among this group of young soldiers studied at Camp Lewis, Addis found six individuals between the ages of 21 and 31 years, with blood pressure levels repeatedly above 150 mm. hg.

TABLE IV.
A study of the "Basal" and "Daytime" blood pressures of this small group of hypertensives not associated with any other discoverable disease.

Name	Condition	Systolic	Diastolic	Pulse Pressure	Pulse Rate
Sa	Basal	170 mm.	105 mm.	65 mm.	64
	Daytime	223 mm.	115 mm.	108 mm.	96
Fr	Basal	140 mm.	90 mm.	65 mm.	64
	Daytime	155 mm.	80 mm.	75 mm.	122
W	Basal	133 mm.	77 mm.	56 mm.	80
	Daytime	164 mm.	78 mm.	86 mm.	93
L	Basal	118 mm.	73 mm.	45 mm.	80
	Daytime	164 mm.	99 mm.	65 mm.	91
Sto	Basal	130 mm.	80 mm.	50 mm.	66
	Daytime	156 mm.	90 mm.	66 mm.	91
Stoc	Basal	120 mm.	85 mm.	35 mm.	60
	Daytime	168 mm.	95 mm.	73 mm.	86

BLOOD PRESSURE AS RELATED TO LIFE INSURANCE

In a discussion of the topic of blood pressure as related to life insurance Frost¹⁰ stated that the medical departments of life insurance companies were slow to recognize the value of blood pressure observations in the physical examination of applicants. In the year 1906, they began to give this some attention, but it was not until 1918, that a routine observation of the systolic and diastolic pressures became a general requirement for applicants for life insurance.

About this time there were many discussions as to what should be considered the upper limits of normal for systolic blood pressure. The opinions varied from a top rating of 140 to a top rating of 170 systolic. In the year 1921, the joint committee of the Actuarial Society of America in conjunction with the Association of Life Insurance Directors analyzed the blood pressure of 596,374 persons. Of this number 545,121 were men, and 51,253 were women; i. e., 10 per cent.

The following table reveals the result of their analyses.

Age	SYSTOLIC		DIASTOLIC	
	Women mm.	Men mm.	Women mm.	Men mm.
20	116	120	77	79
30	119	122	79	81
40	124	125	82	83
50	130	129	85	85
60	134	134	87	87

They have concluded from their experience that elevated blood pressure is of more serious import in the middle years of life. They found that the mortality rate with the age group of 40 to 49 years with elevated blood pressure, was far more excessive than the mortality rate for the age groups 15 to 39 or 50 to 65.

PATHOLOGY

Christian and O'Hare¹¹ in discussing the pathology of hypertension say that nothing is known as to the early changes in essential vascular hypertension. A functional vasoconstriction is assumed; this is pure hypothesis though by no means improbable.

When patients die early in the course of the disease, usually by reason of a vascular accident, we find diffuse thickening of the smaller arteries, but not much change in the larger arteries. The kidneys are red, and are essentially normal, except for a thickening in the smaller arteries and an occasional sclerosed or atrophic glomerulus. These changes may be secondary; no other lesions are found.

Somewhat later in the course of the disease, vascular lesions are more prominent and now arteriosclerotic changes are found in the larger vessels.

A little later renal changes are more evident. The kidney cortex is slightly thinned; the surface is slightly granular; the color is beefy red; sclerosed glomeruli and atrophic tubules are more numerous and the blood vessels are more generally thickened.

These kidney lesions are much less marked than those found in the ordinary type of chronic glomerular nephritis and would seem to be the *result* rather than the *cause* of the vascular disturbance.

In some of these patients we have seen the arterioles everywhere thickened so that in the gross they stood out on cross section with opened lumen and thickened wall in kidney, heart, intestinal wall, etc., and under the microscope the vessel wall was seen to be uniformly thickened, the change mostly in the media. It would seem that these lesions must play an important part in the process.

The more advanced cases have many resemblances both to cases of degenerating arteriosclerosis, and to cases of chronic nephritis. Very often, probably, these three conditions (hypertension, arteriosclerosis, and nephritis) are mingled in the same patient, and it is not possible from autopsy evidence to reconstruct the type, sequence and progression of the lesion.

Baehr¹² is in agreement with the above statement and states that in the last months of their disease they (essential hypertension and chronic glomerular nephritis) are often clinically indistinguishable, for in both the renal insufficiency (dry uremia) is due to progressive hypertensive vascular disease with its inevitable sequel, gradual ischemic destruction of kidney tissue.

At this late stage the differential diagnosis can only be made if a history is available of acute Bright's disease perhaps years previously following an attack of scarlet fever or an attack of streptococcus throat.

According to Bell and Clawson,¹³ in their study of 420 autopsied cases of primary essential hypertension,

the cause of death was anatomically distributed as follows:

Cardiac Group:	
Myocardial insufficiency	44%
Coronary disease	16%
<hr/>	
Total	60%
Cerebral group	19%
Kidney group	9%
Miscellaneous group	12%
<hr/>	
Total	100%

The authors state that in 56 per cent the surfaces of the kidneys were smooth, and in 23 per cent they were finely granular, but there was no reduction in size of the kidneys in either group. Only about 15 per cent of the entire group showed sufficient atrophy to warrant the term "contracted kidney."

The same underlying vascular disease; viz., arteriosclerosis, is present in 90 per cent of all hypertensive kidneys; the lesion is more severe in those showing atrophy.

Microscopically, in the arterioles there is a subintimal deposit of hyaline material which stiffens the walls and narrows the lumen. In the small arteries, there is marked intimal thickening due chiefly to increase in elastic tissue. When the afferent arteriole to a glomerulus becomes occluded the glomerulus undergoes hyaline degeneration and its tubule atrophies.

Malignant hypertension was defined by Fahr as hypertension with uremia. However, only 25 per cent of cases of hypertension with uremia are malignant in the clinical sense; the other 75 per cent show a slowly developing uremia.

Baehr thinks that the malignant phase of essential hypertension is merely a terminal phase of the disease in which the process of hyaline degeneration and vascular sclerosis, even vascular necrosis, is for some reason greatly speeded up. He further believes that the same "speeded up" process can occur as a similar terminal event in chronic glomerular nephritis, rendering the two entities clinically indistinguishable.

TREATMENT

The treatment will vary with the stage in which the blood pressure elevation is discovered and the level of the diastolic reading. Cases with a diastolic level below 100 mm. usually need very little treatment. Where blood pressure elevation is discovered accidentally as during a life insurance examination or during a health examination, the patient should not be told at once that he has "high" blood pressure. No physician is able to know the significance of a single isolated reading of elevated blood pressure. The patient meanwhile should be reassured and told that he has a "slight" elevation of blood pressure which may be of no significance and asked to return for further observations.

If the elevation is present at the second visit, then an investigation into the patient's family history should be made, and inquiries directed as to the existence of strain or anxiety in domestic or business life. If the

patient is accustomed to take large quantities of liquids and use salt heavily, then restriction along these lines should be instituted and the effect noted. Simple sedatives, such as phenobarbital or bromides, are useful to quiet the nervous system and thus disclose the degree to which the nervous system plays a role in elevating the blood pressure.

The patient should be advised to live a life of moderation in all respects; i. e., work and play, eating and drinking, and to get at least eight hours' sleep each night. Frequent short vacations; i. e., two weeks once every three months, may be more beneficial than longer periods that may become boring.

If the patient is overweight, his eating habits should be adjusted so that he may lose weight gradually; i. e., two pounds a week, until he reaches his normal level. As noted above, there is no sound reason for withholding meat from the diet, especially red meat. Low protein diets reduce muscle strength in general, and may weaken the heart muscle so that it can not function as well against the increased load.

Exercise, in moderation, should not be forbidden. I believe that it is beneficial in improving blood distribution and vasomotor tone. The type of exercise should be adjusted to the individual's age, condition, and capacity. Walking, horseback riding and swimming are useful forms and are better than competitive games.

Drugs and specific remedies recommended for the purpose of lowering blood pressure are numerous. But in the initial stages of the disease, in my experience, they have proved ineffective.

In the later stages of the disease when symptoms of a fatiguing heart begin to appear, then cardiac support by digitalis is indicated and should be used even though the pulse is regular. When signs and symptoms of congestive heart failure are present, then the treatment is that customarily used for congestive heart failure. At such a stage venesection with the withdrawal of 500 cc. of blood often produces prompt relief.

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Congenital Absence of the Common Duct*

Three Cases in One Family

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CONGENITAL absence of the gall-bladder including the extrahepatic gall ducts is second in rarity of the anomalies of development. The presence of two livers is given as the most rare. In the cases I wish to report here the gall-bladder was present in all three patients but the common duct was occluded or absent.

Over 175 cases have been reported of congenital obliteration or atresia of one or more of the bile ducts or gall-bladder, as reviewed by Parsons and Hickman,¹ Rolleston and Hayne,² Thompson,³ Wyard,⁴ Holmes,⁵

Ladd,⁶ Emmanuel,⁷ Coburg,⁸ and Kirshbaum.⁹ Most of the cases reported showed the presence of the gall-bladder or a portion of it, and in some, one or more of the ducts or remnants of them were present. As far as I have been able to ascertain, there is only one similar report in the literature where three cases occurred in one family; Sweet¹⁰ reported a similar number of cases in the *Journal of Pediatrics* of October, 1932. Six other cases were reported where there were two cases in each family.

Some authors think the cause is infection of the mother affecting the fetus and causing the malforma-

*Read before the Third District Medical Society, October 27, 1939.

tion. Syphilis, which is given as an etiological factor in all kinds of diseases is also given as a probable cause. Because several cases were found in one family, it does not appear logical to me that infection is a causative factor, but there seems to be a familial type present here.

EMBRYOLOGY

The gall-bladder arises from the saccular portion of the extremity of the hepatic diverticulum. The liver ducts connect the diverticulum with the liver cords. One of these persists as the hepatic duct which joins the cystic duct of the gall-bladder. The portion of the diverticulum proximal to this union becomes the common duct, or ductus choledochus. The gall-bladder and the common duct are solid in the embryo of 6.8 mm. (Piper, 1900) and in that of 6.75 mm. (Kerbel and Elze, 1908). These are the youngest stages of the embryo which have been observed. In the embryo of 7.5 mm. there is a lumen in the common bile duct, but the gall-bladder is impervious. Near the hepatic duct the lumen is subdivided, appearing in cross-section as two or three minute pores. In embryos of 10 mm., the gall-bladder and the extrahepatic ducts have become longer and more slender. In embryos of 16 mm., there are irregular subdivisions near the hepatic duct, and the distal part of the gall-bladder is solid, but in both the cystic duct and the common duct the lumen is single and well defined. Arey stated that the cavity of the gall-bladder appears after the embryo is 15 mm., and is surrounded by high columnar epithelium. The extrahepatic ducts are first patent, then lose their lumens by a proliferation of the epithelium to become solid cords, only to become patent later. The complexity of the embryologic development of the liver and bile ducts makes the wide variety of malformations seem logical (Ylppo¹¹).

CASE REPORTS

Mrs. I. E. White, age 40. The patient's family history shows one sister who died of cancer of the uterus at the age of 40. This sister was chronically jaundiced all her life, but never had any acute attack of biliary colic that the patient knows of. All other family history is negative.

Personal History. The Wassermann tests are negative in both husband and wife. The patient has always been anemic, and of slight build; height 4 feet 11 inches with an average weight of 96 pounds. In 1920, she passed a stone from the left kidney, and since then has frequently passed fine sand. She has had no X-rays of the urinary tract. The patient has never had any

symptoms of jaundice or biliary disease. Six years ago she had gastric ulcers which were treated medically.

Obstetrical History. Albumen has been present in the urine during each of six pregnancies, and twice she has had generalized edema. During every pregnancy she has also developed a marked anemia. Twin girls were born at eight months gestation on June 8, 1927. Both of these babies developed icterus which cleared up in a few weeks. These children are living and well at present. September 1, 1929, a female child was born at eight months gestation which developed a very severe icterus the second day and died at the age of five days. The post-mortem examination showed the ampulla of Vater was not patent. February 7, 1931, a male child was born at term. This child had a very large tumor in the abdomen which proved to be the liver. No jaundice was present at birth, but developed immediately after, and the skin became extremely jaundiced. The tumor mass in the abdomen reduced in size rapidly. The baby died at the age of one week. Postmortem examination showed an entire absence of $\frac{1}{2}$ cm. of the common duct above the ampulla of Vater. All the tissues and organs of the body were extremely icteric. December 8, 1932, she had a miscarriage at seven months. January 17, 1934, a baby was born at full term which developed icterus immediately after birth and died at the age of three days. Postmortem examination showed the common duct for a distance of 3 mm. at the lower end was entirely occluded, and was represented as a mere thread of tissue. On November 24, 1936, the patient miscarried, expelling a seven months fetus which was badly macerated. I did not treat her this time and no postmortem examination was made on the fetus.

Here, then, is a history of icterus throughout the life of an aunt on the mother's side of the family. There were six pregnancies, five delivered, who were icteric; in three children postmortem examination showed occlusion of the common bile duct, which seems to prove an inherited tendency toward defects of the biliary tract in some cases of absence of one or more bile ducts rather than infection as the etiological factor.

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Hearing Impairment in College Students*

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THE conservation of hearing has been a neglected subject in preventive medicine because of a lack of fundamental knowledge pertaining to the problem.

The incidence of hearing impairment is definitely less among college students than among school children for the former constitutes a highly selected group as regards economic and social status, medical care and other factors which affect the health of the special sense organs. Nevertheless many students enter college with undetected hearing defects; others develop deficiencies during their college years. Accurate hearing tests on admission are therefore especially important. The presence of deficient perception for the higher pitches at this age sometimes indicates the beginning of degenerative changes which may insidiously extend to the lower frequencies. Unrecognizable losses for the higher tones are known to cause minor speech defects among students and difficulties in acquiring a speaking knowledge of foreign languages because of inability to hear certain consonant sounds or to differentiate between similar elementary speech sounds of high pitch.

The recent development of the audiometer for accurately measuring hearing acuity marks a new era in otology. It has made possible research which has revealed certain fundamental facts regarding the hearing which should be known by every physician, educator, nurse, welfare worker and graduate of a college or university maintaining a student health service. This is necessary in order to make progress in conserving the hearing on a scale commensurate with achievement in other fields of preventive medicine. Among the elementary facts regarding this problem we find the following:

1. Wide application of the audiometer has disclosed an unexpectedly high incidence of significant hearing loss among our population. By a significant hearing deficiency we mean any impairment of hearing which is capable of interfering with the normal acquisition of articulate speech, a liberal education and a personality which will insure one's economic and social security.

2. The audiometer has emphasized the importance of the early discovery of these deficiencies and the prompt removal of all discoverable causes, which is simply the application of the first principle of preventive medicine.

3. It has proved that the older methods for testing and measuring degrees of hearing acuity—the watch-tick, acoumeter, whisper, conversation voice and the quantitative tuning fork tests as usually applied, have been too crude, inaccurate and time-consuming for the requirements of modern otology.

4. It has emphasized the fact that one may gradually lose a considerable amount of his original hearing acuity without being aware of his loss, with consequent delay in seeking medical care.

5. Its use has proved that accurate tests cannot be made in the presence of interfering noises.

6. Thousands of audiometer tests among school children have shown that hearing deficiencies so slight as to be unnoticed by parents and teachers often cause retardation, speech defects, inferiority complexes and emotional and social maladjustments. These, if not corrected, do irreparable damage to the child's development.

Most recently Drs. Crowe and Guild have shown that hearing defects for the higher frequencies in public schools frequently indicate the presence of obstructing lymphoid tissue in and about the eustachian tubes. When not curable by surgery, the condition often yields to radon irradiation, with resulting improvement in hearing. This calls for a revision of our conception of the pathology and treatment of certain refractory cases of progressive hearing impairment in the young and confirms the teaching that many cases of gradually handicapping hearing loss, first known in adult life, result from tubal and middle ear involvement in early life.

Today it is recognized that with our increased knowledge of the causes of ear diseases, a constantly growing number of cases of hearing impairment are preventable or amenable to treatment. Based on the results of several million hearing tests by modern methods it is conceded that of all measures for conserving the hearing on a comprehensive scale, the most effective means is the incorporation in the public school health program of the periodic testing of the hearing of all pupils with the audiometer and the implied medical follow-up of those discovered to have significant hearing defects. Such tests are compulsory by law in New York, Pennsylvania and Oklahoma and are successfully used in hundreds of widely distributed cities and smaller communities.

Warren H. Gardner, Ph.D., Chairman of the Committee on Hard of Hearing Children of the American Society for the Hard of Hearing, reports that during the school year of 1938-39, more than 1,871,000 pupils in 767 communities and 125 counties were tested by this means. This is a remarkable gain over previous years but the number covers only a small percent of our population of school age. The incidence of hearing deficiencies was 6.9 per cent on a basis of nine decibels loss on two tests by the phonograph audiometer. The incidence is higher among the lower grades because these pupils have not had the benefit of corrective care. Boys show a higher incidence than girls.

For making mass screening tests involving large numbers of school children, the 4A, 4B and 4C Western

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Electric phonograph audiometer has been almost exclusively used because of its speed of operation and far greater accuracy than was attainable with formerly used methods. It made possible the discovery of many thousands of persons with threatened or existing hearing handicaps, and its use will be continued in communities which already own it. Its chief limitations are that it fails to detect high-pitch deficiencies and cannot be advantageously used for testing children who are too young to write dictated numbers when the saving of time is a consideration. This should be known to every physician and school executive.

The needs of the student health service are best met by audiometers of the pure-tone type, having a uniform zero reference level and affording test tones at octave intervals or less from 128 to 8192, or preferably 11,584 double vibrations per second. Such instruments are now available at a low price. For rapidly screening groups by individual, air-conduction tests they have a capacity of 25 or more persons per hour.

For diagnostic and research purposes additional equipment for bone conduction tests and masking is necessary. One has added security in the purchase of an audiometer if it has been "accepted" by the Council on Physical Therapy of the American Medical Association.

To insure accuracy in making hearing tests the noise level must be reduced to a practical working minimum by the exclusion of interfering noises. This is accomplished by the acoustic treatment of a small space (minimum of 4'x6', height 6'4") which can be used also for other purposes. The tests should be made by a trained nurse or technician under medical supervision and the findings evaluated by a staff physician.

The University of Minnesota Health Service, under the administration of Dr. Diehl and later by Dr. Boynton, has made audiometer tests of all students for more than ten years, the technic having been improved as better instruments have been developed. Students found to have a loss of nine decibels or more in one or both ears, in the speech level, or of 25 or more decibels in the frequencies above 4096 d.v. are given a critical otolaryngological examination supplementing the routine examination to determine if possible the cause of the defect.

Of a group of 5121 new students at the University of Minnesota tested with the pure-tone audiometer in the school year 1939-40, of whom 3111 were men and 2010 were women, 17.0 per cent of the men and 8.3 per cent of the women had a significant impairment, with a definite preponderance of loss for the higher frequencies. The average incidence was 13.6 per cent. These figures are higher than the incidence among school children because of the use of the pure-tone audiometer in testing the University group.

F. M. Hurd, B.S., M.D., in an unpublished thesis on Hearing Loss in the University Age Group, based on a study of 180 cases, brought out among other facts that

1. Seventy per cent of those who were found to have a definite loss were not aware that they had a hearing defect.
2. In 40 per cent of the cases conditions were present which if uncorrected were likely to be a factor in causing further loss.
3. Some definite cause to which the hearing loss could reasonably be ascribed was ascertained in 90 per cent of the cases.
4. In 90 per cent of the cases the hearing loss was bilateral.

Accurate hearing tests by the audiometer should be made an important feature of the student health program of every university, college and institution for professional training, including teachers colleges and hospital schools of nursing.

Audiometer tests of students should be made on admission, annually thereafter and following any illness which might affect the hearing.

The primary benefit of such tests accrues to the individual student. Of equal importance is its value in the growing field of health education, a recognized function of the student health service. This is far-reaching, for the student, having learned in college the need for early discovery and correction of conditions which jeopardize health, after graduation is conscious of his responsibility as a leader in movements toward community welfare. He often will actively encourage organized effort to conserve the hearing.

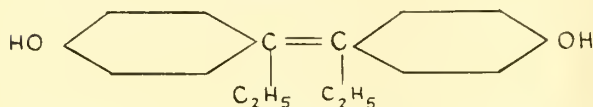
Diethylstilbestrol*

A Review of Literature

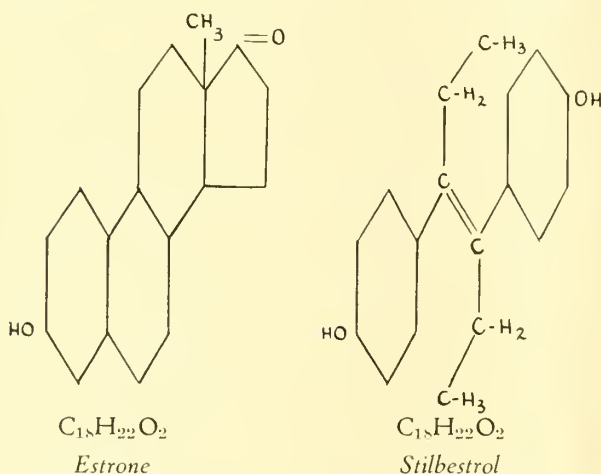
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THE formulae of the natural estrogenic compounds, estrone, estriol, estradiol, contain the phenanthrene nucleus. These natural hormones are potent therapeutic agents but are difficult to extract in pure form, must be biologically standardized unless in pure form, are relatively ineffective orally, and thus are expensive. The synthesis of these compounds is difficult because of the many possible stereo-isomeric forms. In 1933 a "synthetic estrus-exciting compound" of low potency, 1-Keto 1:2:3:4:tetrahydrophenanthrene, was synthesized.¹⁶ In 1936 the same research workers found that the phenanthrene nucleus was not necessary in synthetic estrus-exciting compounds.^{21,22,26} Prolonged research by Dodds and his co-workers led to the discovery that the stilbenes, a hydrocarbon series derived from ethylene, are estrogenic. The most potent of these stilbenes was found to be 4 : 4' dihydroxy α : β diethylstilbene. Since this compound seemed to be the basic estrogenic stilbene, they suggested the name "Stilbestrol", which has since been adopted.^{22,23,24,25,26,29,30,31}

The formula of stilbestrol is:



Some stress is laid on the fact that this formula may be graphically written in a manner similar to the natural estrogens.^{29,31}



The esters of stilbestrol, the dipropionate and the diacetate, prolong the action but decrease the potency of the compound.^{5,28}

There are many other compounds similar in chemical structure to stilbestrol which have been and will be in-

*Read before the Minneapolis Clinical Club, November 14, 1940.

vestigated for estrogenic action. Of these one of the most promising is "Hexestrol", similar in structure to stilbestrol but with only one linkage instead of a double bond in the central carbon atoms. This compound appears to be less toxic but also much less potent.^{5,26,31}

Many trade names are already confusing the nomenclature of stilbestrol—"Cyren", "Estilbin", "Estrobene", "Oestrostilben", etc.

EFFECTS OF STILBESTROL ON LABORATORY ANIMALS

Diethylstilbestrol is estrogenic. It produces estrus in castrated female animals when given orally, parenterally or by inunction.

Subcutaneously stilbestrol is, weight for weight, of equal potency to estrone,^{27,36,60} but only one-third to one-half as potent as estradiol.⁷² By inunction it is only one-fourth to one-third as potent as estrone.⁶⁹ However, orally stilbestrol is five times⁶⁹ to 20 times⁶⁰ as potent as estrone, and six times as potent as estradiol⁶⁰ by mouth.

One milligram of stilbestrol has the potency of 5,000 (⁸¹ discussion), 6,600⁴³ to 25,000^{17,58} international units of estrone, or 1 gram is the equivalent in action of 3,000,000 rat units.

In ovariectomized animals (mice, rats, cats, rabbits, monkeys), stilbestrol induces proliferation of the endometrium.^{27,49,54,70,79} Large doses cause hypertrophy of the myometrium and hyperplasia of the endometrium.⁵⁴

The proliferative phase produced does not show any progesterone-like appearance as is sometimes found in the proliferation produced by the natural hormones.⁷⁰ The proliferative endometrium produced can be acted upon by progesterone to give the picture of secretory or functional endometrium, that is, stilbestrol sensitizes the endometrium to progesterone.^{27,49,54,70,79}

Stilbestrol stimulates the growth of the nipple and ducts of the breasts rather than the glandular tissue.^{27,54} Lactation is inhibited in rats⁴⁰ and the crop gland response to prolactin in pigeons is partially inhibited by stilbestrol.⁴⁰

One gram subcutaneously to cows in advanced lactation produced no change in the yield of milk but gave a milk with increased fat content, increased lactose, and increased non-fatty solids, over a 25-day period. This observation may be of value to dairymen.⁴⁰

The drug produces mating instinct in ovariectomized rats and guinea pigs,^{27,69} but large doses are necessary. In male cats castrated two to five months previously, 30 to 60 mgm. of stilbestrol induced normal male cat response to females in rut.⁴⁹

It is anti-androgenic and feminizing. Given with androgens, it inhibits the growth of comb in capons.⁷⁵ It produces intersexuality in male embryo rats when

given to the pregnant rat,⁸⁶ and produces 82 per cent females in the offspring, if given to pregnant female rats, the remainder, 18 per cent, being intersexual.⁵⁴

In rats, body growth is inhibited,^{54,70,77,78} the ovaries tend to atrophy^{54,70,77,78} and the anterior pituitary gonadotrophic hormones are depressed, or absent,^{54,70,77,78} but the pituitary and adrenal glands are increased in weight.^{70,77} Moreover, injections of APL-P.U. will again stimulate growth of ovaries, which does not occur after hypophysectomy.⁷⁰ In male rats the testicles atrophy after prolonged doses of stilbestrol.^{60,77,96}

In very early pregnancy in rabbits the drug prevents nidation of the blastocyst.^{8,80} Large doses of stilbestrol will cause death of the embryos and subsequent absorption or abortions in pregnant rabbits and guinea pigs.^{8,52} In cows, there is evidence that stilbestrol will cause abortion in late pregnancy.⁴¹

Prolonged injection of stilbestrol leads eventually, in the dog, to complete failure of blood production in the bone marrow.^{2,54} Stilbestrol causes vasodilatation¹⁸ and prevents necrosis of the tail in rats given ergotamine tartrate.¹² Blood sugar and liver glycogen are increased after five to twenty days of small doses of stilbestrol in rats.⁵⁵ Lipemia and calcemia are induced in roosters by stilbestrol.⁷⁶ Contraction of smooth muscle of all types in Ringer's solution is inhibited by very dilute concentrations of stilbestrol, but this action cannot be obtained by intravenous or oral stilbestrol in much stronger concentrations.¹⁸

TOXICITY TO ANIMALS

Continued large doses of stilbestrol is toxic to all animals tested—mice, rats, guinea pigs, rabbits. The liver is chiefly affected and toxic hepatitis with profound icterus results.^{51,52,60,68,89} In females eventually the uterus becomes much enlarged and pyometra results.

Mammary carcinoma has developed after prolonged dosage of stilbestrol in a pure strain of non-cancerous rats,⁴⁷ in male rats⁶¹ and in susceptible female mice (discussion⁸¹). Comparable doses in women would be 1 gram per week for 20 years.

METABOLISM OF STILBESTROL

Stilbestrol appears in the urine within five hours after administration and excretion continues for five days.¹¹ It is recoverable in amounts of 20 to 50 per cent in the excreta as compared to a recovery value of 1.5 per cent of estrone. It is therefore but slowly inactivated by the body.¹⁰¹ Benzoic acid is one of its end products.⁹² It seems that although the body has elaborated a means of inactivating the natural hormones, no rapid detoxifying mechanism against stilbestrol is present in the body.^{34,91}

BIOLOGICAL DIFFERENCES IN NATURAL AND SYNTHETIC ESTROGENS

Natural estrogens both by injection or inunction inhibit the growth of combs in capons given male sex hormone. Stilbestrol will exhibit this inhibitory action by injection but not by inunction.⁷⁵

Estrone added to the water will cause growth of the genitalia in female bitterlings. Stilbestrol has no such action even in 100 times the concentration.³³

Stilbestrol injected into the uterus does not stimulate the thyroid gland, whereas estrone does.⁶⁸

OBJECTIVE SIGNS PRODUCED BY STILBESTROL WHEN GIVEN TO HUMAN FEMALE

The genital tract shows the most marked changes. There is proliferation of the vaginal mucosa,^{7,88} vaginal smears show estrus changes in 14 days (by injection) to 21 days (oral administration)⁷² or 4 to 10 days.^{17,53,88} Slow regression to former castrate vaginal smears occurs in two to four weeks after the drug is discontinued.^{53,72,88} In some cases regressive changes in vaginal smears are seen during prolonged administration.⁹¹ The pH. of the vagina is changed from 6.5 to as low as 4.0^{56,57} although stilbestrol is only one-third to one-half as potent as estradiol in acidifying the vagina.⁹⁰

The hypoplastic uterus will grow in size under stilbestrol administration.^{39,50,66}

The effect on the endometrium depends to a certain extent on the dosage but there is considerable individual variation.⁸⁸ The smaller doses produce proliferative endometrium, 15 to 25 mgm.,⁷ 10 mgm.,⁸⁸ 20 to 25 mgm.,⁵⁰ 12 mgm.,³⁵ 25 mgm.,⁹⁸ 30 mgm.,⁹⁹ when administered over a period of five days to three weeks.

The proliferative endometrium produced may differ from that produced by the natural estrogens in that it has a looser stroma containing blood.^{83,88}

Stilbestrol sensitizes the human endometrium to progesterone. After proliferative endometrium has been induced by stilbestrol, then functional or secretory endometrium is induced by progesterone either synthetic or natural.^{8,35,50,98}

The dosage of progesterone is a total of 40 mgm.³⁵ to 300 mgm.,⁹⁸ or five rabbit units daily for five days.⁵⁰

Larger doses of stilbestrol tend to produce hyperplasia of the endometrium (60 to 75 mgm. by mouth^{35,72,88,98,99}) although others^{17,20,59} were unable to confirm this.

Uterine bleeding may occur during the administration of stilbestrol,^{17,72,81} but withdrawal bleeding is more common.^{17,59} On normal women stilbestrol produced irregularities in time of menses.⁶⁷ Uterine bleeding from hyperplastic endometrium induced by large doses of stilbestrol was stopped in two cases by progesterone.⁷² Hematometra and hematocolpos are reported to have occurred in one patient after 290 mgm. of stilbestrol by mouth.²⁰

Karnaky^{56,57,58} reports cessation of functional uterine bleeding in 400 cases within 12 hours after the administration of 10 to 25 mgm. of stilbestrol. In the same article⁵⁸ he states that he has not seen an adenocarcinoma of the uterine fundus in seven years in his clinic which treats 10,000 women yearly.

The ovary in animals atrophies with large doses of stilbestrol (see above). Karnaky⁵⁸ reports that cystic ovaries in women (14 cases) regress in size with a dosage of 5 mgm. each night for 20 nights.

The nipples and duct system of the breasts are stimulated.^{4,17,50,53} but there does not appear to be any action on the secretory tissue of the breast.^{4,17} The areola become deeply pigmented, in some cases quite black.^{17,50,53,63,66} Other pigmented areas in the body are also stimulated to produce darker pigments.^{17,67} On this account we should be very careful with its ad-

ministration in a patient with pigmented moles. (F. L. Adair discussion¹⁷).

Normal blood pressures are unchanged and hypertension may or may not be reduced.^{53,71} Pulse rate is not affected.⁸¹ Stilbestrol acts as a mild laxative.⁸¹ Urinalysis shows no changes in kidney function.^{17,72} Only one patient showed albuminuria which disappeared when the drug was discontinued.¹⁰ Repeated liver tests have not shown any definite change in liver function.^{10,17} Necropsies in women, dead of malignant disease who had recently received large doses of stilbestrol (250 mgm., 350 mgm. and 1125 mgm.) showed "no more than the usual changes seen in patients who die after a prolonged illness such as the result of malignancy."¹⁷

SUBJECTIVE SIDE EFFECTS

Some patients report a feeling of a general sense of well being,^{17,72,81} others feel a general lassitude, and others report a feeling of being drugged while receiving stilbestrol.^{88,91}

Some menopausal patients report a return or increase of libido.^{17,72,19,53} Others merely note improvement in coitus due to the more normal vaginal flora and secretion¹⁷ but some report libido unchanged.

UNDESIRABLE AND TOXIC SIDE EFFECTS

Many undesirable side effects may follow the use of the drug although there are no reports of fatal or even serious conditions arising from its administration, even over prolonged periods.

Nausea and vomiting is reported by all investigators but the percentage of nauseated patients varies widely, from 1 to 80 per cent. The emetic action is central in origin as it appears after all methods of administration of the drug, but there are probably individual idiosyncrasies to the drug. The nausea and vomiting tends to decrease and disappear if the administration of the drug is continued over a longer period. It has been noted that clinic patients report less nausea and vomiting than private patients (Greenhill).

Abdominal distress, flatulence, diarrhea, unquenchable thirst, hunger, anorexia have been reported as other distressing gastrointestinal symptoms.⁸⁸ All gastrointestinal symptoms appear more marked in younger women.⁵⁵ Skin rashes may appear⁹¹ although psoriasis began to disappear after stilbestrol administration in one patient.⁵³ Vertigo, paresthesias, and psychosis have been noted.⁹¹ Pelvic pains and a feeling of congestion in the pelvis are probably due to overdosage.⁵³ Precordial pain after a small dose (0.2 mgm.) of stilbestrol has been reported.⁸⁸ Edema of the vulva has appeared in several patients^{62,88} but disappeared rapidly after discontinuing the drug.

Tolerance to the drug is undoubtedly an individual idiosyncrasy but smaller doses, taken in milk at bedtime over a prolonged period have been found to cause less and less undesirable side-effects.⁹⁷ The postpartum patient also appears to tolerate the drug much better than the gynecological patient.⁴⁸

THERAPEUTIC AND CLINICAL USE

A. Menopausal Syndrome.

Stilbestrol has been reported by many investigators to give good results (75 to 100 per cent relief) in the treat-

ment of the genital symptoms of the menopause such as senile vaginitis, kraurosis vulvae and pruritus vulvae. 1,4,8,9,14,17,19,20,35,38,43,46,53,59,63,64,67,81,72,84,88,91,96,97,100.

The extragenital menopausal symptoms are also relieved. Symptoms so affected include flushes, chills, headaches, nervousness, nervous tension, mental depression, palpitation, fatigue.^{1,4,5,6,7,8,10,14,17,20,35,38,39,42,43,44,50,54,56,59,63,64,67,72,84,85,91,94,98,99,100} Most writers consider decrease of, or complete relief from hot flushes to be an index of therapeutic success.

Stilbestrol appears to be most effective for the relief of hot flushes and vasomotor symptoms in young women with an artificial menopause induced by surgery or by radiation.^{38,44,63,50} Although some investigators report remarkable relief from all menopausal symptoms with the administration of the drug, others suggest that the unpleasant symptoms of the natural menopause are more amenable to treatment with the natural estrogens.

Postmenopausal bleeding occurs either during the administration of the drug or after its withdrawal in many women.^{4,17,19,20,46,53,63,72,88,97} Epistaxis is reported¹⁹ Endometrial biopsies in many patients showed proliferative or hyperplastic endometrium. There is no report of malignant changes in the endometrium following the administration of this synthetic estrogen.

Menopausal arthralgias have been relieved by stilbestrol^{13,42,97} and one patient with trigeminal neuralgia reported relief from this condition as well as from her menopausal symptoms while taking stilbestrol.³⁵

The involuntional melancholias of this age group of women are reported as being improved by stilbestrol.⁵³ These patients tolerated large doses of the drug.

There is no unanimity of opinion regarding the dosage of this drug, possibly because the relief of symptoms has no relation to the dosage.¹⁰ Some women cannot tolerate the drug by any route of administration. For those who can tolerate the drug the dosage in menopausal conditions will be indicated by: (1) relief of symptoms particularly hot flushes, (2) changes in vaginal smears from atrophic to estrus type. For many women this dosage will be 15 to 25 mgm. by mouth in seven to fourteen days, followed by a gradually decreasing dose until a maintenance daily or weekly dosage is obtained. The maintenance dose may be from 0.1 mgm. daily to 1.0 mgm. weekly. Pellets of 100 mgm. of stilbestrol implanted subcutaneously in the lumbar region are said to give much more effective relief in patients with menopausal symptoms. One such "artificial ovary" will last 400 to 800 days (or one to two years). Pellets removed and weighed after varying periods showed a loss in weight corresponding to 0.127 mgm. to 0.250 mgm. daily (2500 to 5000 international units daily). No toxic symptoms or effects were noted.⁷¹

B. Disorders of Menstruation.

1. *Amenorrhoea.* (a) *Primary.* Primary amenorrhoea has been treated by this synthetic estrogen^{4,5,17,35,38,56,66,85,91,100.} Davis¹⁷ and Lisser⁶⁶ have reported some remarkable changes and their reports should be read. These patients are treated over prolonged periods with sub-tolerance doses of the drug, 1 to 5 mgm. daily over

many months. (b) *Secondary amenorrhea* has been treated also^{1,38,64,67,85,100} The indications are not stated in most reports but postpartum amenorrhea is a frequent indication. Menstrual flow was induced in most cases by stilbestrol to 25 mgm., although stilbestrol followed by progesterone appeared necessary in some cases.

2. *Dysmenorrhea*. The common complaint of dysmenorrhea has been, of course, treated by the drug^{4,3,38,54,56,64,67,100} Relief was obtained in patients with "hypoplasia of the uterus," with acute ante flexion.^{38,64} Many investigators do not report pelvic findings. The dosage again is not uniform. Total dosage over the first two weeks of the menstrual cycle varied from 12 to 30 mgm. The results are inconclusive.

3. *Hypoestrinism*. This syndrome is characterized by "nervousness, headache, dizziness, flushes, depression, frigidity, insomnia, irritability at or prior to menses, premenstrual tension, premenstrual breast pains, muscle and joint pains, oligomenorrhea, dysmenorrhea."^{14,97} The dose is suggested as 5 mgm. intramuscularly just prior to or at the onset of symptoms. Possibly all these groups, amenorrhea, dysmenorrhea, hypoestrinism are lacking in estrogens and substitution therapy may be indicated over long periods. "No one doubts the wisdom of continued substitution therapy in hypothyroidism, in diabetes, and in other glandular deficiencies. Why should one doubt the wisdom of continued therapy in hypovarianism?" (Davis¹⁷).

C. *Gonorrheal Vulvovaginitis in Children*.

Investigators have reported the use of stilbestrol in the treatment of gonorrheal vulvovaginitis in children^{56,57,58,81} discussion.⁸⁷ Ages varied from 20 months to 12 years. The drug is given in milk, (a) 1 mgm. each night for six days,⁸⁷ (b) total of 4 mgm. in one week^{56,57}, (c) 1 mgm. daily for 30 days⁵⁸ irrespective of age. Nausea occurred in some children, breast enlargement with darkening of the areola and vulvar edema in 75 per cent. All were cured, although the course of treatment was repeated in about 5 per cent. The undesirable side-effects regressed after discontinuing of the drug. One great advantage of the drug by mouth is that the child is not made genitally conscious.

Russ and Collins⁸⁷ report that they "are enthusiastic about the use and efficiency" of the drug in the treatment of this condition.

D. *Use in Pregnancy, Labor and Puerperium*.

The effect of stilbestrol has been studied on late pregnancy⁸² on postpartum morbidity¹⁵ and on lactation.

Peel⁸² reported investigations into the effects of stilbestrol in pregnancy and labor. He believes it gives a better tone to the uterine muscle in late pregnancy but that it is of doubtful value in inducing labor at or near term. In three cases of missed abortion, however, labor was induced successfully. It is of some value in true uterine inertia.⁸²

Postpartum morbidity was decreased (from 12.8 per cent to 4 per cent) by 5 mgm. daily for ten days in puerperal patients.¹⁵

Lactation is inhibited or suppressed when stilbestrol is administered postpartum.^{1,5,7,9,15,48,59,62,64,65,74,85,98,99} The drug should be started immediately postpar-

tum and continued for three to five days. The dosage is given as a minimum of 5 mgm. but other reports suggest 5 mgm. three times a day for five days. Lactation is often re-established when the drug is discontinued. However, even small doses are sufficient to inhibit engorgement of the breasts. The puerperal patient tolerates the drug remarkably well,⁴⁸ only one toxic symptom, vulvar edema, being reported in a postpartum patient.⁶²

COMMENT

The new synthetic estrogen, Diethylstilbene, "Stilbestrol", appears to have all the estrogenic properties of the natural estrogens. Its advantages are: (1) it is potent when administered orally, whereas the natural estrogens lose most of their value when given by mouth, (2) it is readily synthesized and thus should be inexpensive. Most investigators, however, note its undesirable side effects and warn against its general use until further investigations have found the cause of these effects or have produced an equally potent but less toxic estrogen. This attitude is probably a result of the many reports of severe toxic and occasionally fatal results which followed the general use of other synthetic compounds in the past few years. It may well be placed on the list of restricted drugs if and when it is introduced.

The dosage of many of our potent therapeutic drugs is determined to some extent by simple quantitative laboratory tests. Vaginal smears are sufficiently accurate to estimate the dosage of stilbestrol but the knowledge of their interpretation should be more widespread before the drug is generally introduced.

From this review of the literature it would appear that stilbestrol may be of value as a therapeutic agent in the treatment of certain gynecological and obstetrical disorders, particularly (1) menopausal syndrome especially for the symptoms of induced or artificial menopause, (2) gonorrheal vulvovaginitis in children, (3) inhibition of lactation and/or prevention of engorgement of breasts in the postpartum patient.

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DISCUSSION

Dr. R. T. LAVAKE: Dr. McKenzie has given us a most scholarly and interesting resume. It reminds me of the time when the diathermy machine first came out. It seemed then, from first glowing reports that it was almost criminal not to use the machine in cases of gonorrhoea in the female; and this resume would make it seem almost criminal not to use this drug. It apparently accomplishes nearly everything, not the least of which is a schoolgirl skin and complexion, and it would seem to offer a simple substitute for a great many related but expensive compounds. If we could only obviate the rise in blood pressure, such a substitution might seem indicated at first glance. I have had no personal experience with this product and can discuss it only from the standpoint of related substances.

Though Novak and many other authorities say that there is no ground for the following attitude, I do not believe in giving estrogenic substances to a woman in the menopause, especially if she has a cancer heredity, unless the patient assumes the responsibility after being given certain significant facts. I can remember when some women were castrated for cancer and in many cases the cancer regressed or its progress appeared to be slowed down. By the same token, animal experimentation proves that estrogenic substances are carcinogenic, especially in cancer strains. Cancer heredity is most obvious in some individuals but it is likely that all of us have cancer strains in our remote ancestry. For these reasons I would not demand or sanction the use of estrogens in my family in the menopause and believe that we should use another approach. It suggests itself that nature likely knows more than we do about when a woman should cease having estrogenic stimulation. Cessation may be a beneficent and protective action. I have never seen anything serious attributable to the menopause, happen to any woman unless she were primarily a psychopath. We can all likely cite subjective improvement following estrogenic therapy but so can most of us recount many like results following ex-

perimental normal saline injections, which would suggest a great psychic element in the symptoms. This resume has been very thorough, instructive and interesting. The results given polarize the attention, but seem too good to be free from some catch. The substance certainly warrants close attention.

Dr. H. M. N. WYNNE: I have had no clinical experience with stilbestrol. The enthusiastic reports on this substance suggest that it will replace the pessary in the gynecological armamentarium of over fifty years ago.

Senile vaginitis is simply a nonspecific infection of the postmenopausal vagina. The treatment of senile vaginitis by estrogenic substances alone is based on the physiological response of the mucous membrane which assumes the premenopausal adult type of epithelium, if a sufficient amount of estrogen has been given. This type of vaginal epithelium containing glycogen produces a more acid vaginal secretion which is detrimental to the growth of the usual nonspecific infecting organisms. After the infection has cleared up under estrogenic therapy the administration of estrogen can be stopped, and while the vaginal epithelium reverts to the postmenopausal type, the patient will not need more medication.

Dr. McKenzie is to be congratulated on his very thorough review of the literature on the use of stilbestrol.

Dr. C. J. EHRENBURG: I, too, would like to compliment Dr. McKenzie on the quality of this review. In this day of such an extensive literature in a diversity of subjects, presentations of this kind should be accorded more of our time.

One must take issue with the attitude of Dr. LaVake toward all estrogen therapy. We must admit at the outset that we know very little of the biochemistry of therapeutic estrogen, but is the same not true of other therapies such as thyroid, insulin, sulfanilamide, etc.? The basal metabolic rate and the blood sugar and the blood concentration determinations of the sulfanilamide group of drugs are objective criteria which have no such mathematical counterpart in estrogen therapy. However, vaginal smear studies after some experience are a fair index to the dosage levels of estrogen particularly in the menopausal women. For a number of reasons Dr. LaVake's emphasis of the carcinoma relationship to estrogen therapy is not justified. Certainly, the castration treatment of cancer could have had but little value, otherwise it would not have been completely abandoned as at present. Further, while a few reports have been made of breast carcinoma developing after estrogen therapy, when one considers the widespread use of the therapy and the frequency of breast carcinoma some coincidence is to be expected. From the experimental standpoint, Dr. McKenzie has already pointed out that the doses used in experimental animals are in no way comparable to those used therapeutically. If we are to accept the experimental production of cancer with estrogens as a basis for withholding estrogen therapy to women because of hidden cancer tendencies, then we must also accept the work of Dr. Bittner of Bar Harbor, in which he showed us last year that cancer in the rat is transmitted through the maternal milk. It would be just as logical for Dr. LaVake to use Dr. Bittner's findings as a basis for discontinuing all human maternal nursing.

Also, if we are to accept the philosophy of the superior knowledge of nature in changing the metabolism of estrogens at a certain time in a woman's life to such an extent that we are going to withhold a known relief, why not extend the philosophy further and apply it to hypo and hyperthyroidism, diabetes, Addison's disease, and others, and withhold treatment on the assumption that nature knows best.

I frankly admit that I have some enthusiasm for estrogen therapy and this is the result of its successful use in the hypoestrin states that Dr. McKenzie mentioned. Not all of these are menopausal. One finds hypoestrinism manifested in menstrual irregularities, sterility, dysmenorrhea, migraine, vaginitis, etc. Obviously these conditions are only symptoms and do not have their only source in lowered estrin states. It is here that the vaginal smear technique is valuable in differentiation. Severinghaus not only uses the smear as a guide to estrogen therapy but also in prolan therapy. As I said before, although the vaginal smear is not entirely accurate it is objective in determining the need for estrogens and then is definitely of value in guiding dosage levels.

We have had stilbestrol available to us both in the office and in the gynecologic endocrine dispensary for about a year. On the whole its use has been satisfactory, but we have had about the same untoward effects that Dr. McKenzie mentioned. One woman had an increase of her systolic blood pressure to 160 after a week of 2 mgm. a day. On stopping the treatment the blood pressure came down quickly to 120. We did not repeat the treatment. Another older woman with an extremely severe pruritus vulvae which was completely controlled by 1 mgm. of stilbestrol a day, had what was thought to be an attack of coronary disease. Dr. Joe Taylor, after a thorough examination including an electrocardiogram, could not verify this. The drug was discontinued and no more discomfort was felt. After some days the treatment was resumed with again the production of anginal pain. The treatment was discontinued a second time and the patient has had no more pain. This occurred three months ago. The occurrence of such a phenomenon has not been reported to my knowledge. Nausea has occurred in about one in five patients. However, we have found that if such a patient is first built up to a follicular level vaginal smear with natural estrogen, she will then tolerate the stilbestrol much better. Vertigo has also been an occasional symptom. In a few patients we have been unable to influence the vaginal smear with doses up to 5 mgm. of stilbestrol daily. These patients have then responded to the natural estrogens with a dose far below the supposed equivalent of stilbestrol. This would seem to indicate that all women do not have an estrogenic response to stilbestrol and also demonstrates the value of the vaginal smear for determining therapeutic response.

On an average we have found that a satisfactory response is obtained with a dosage of from $\frac{1}{2}$ mgm. to 2 mgm. daily, which is probably the equivalent of from 3,000 to 12,000 I. V. of estrone.

The results obtained with the imbedding of pellets of stilbestrol are intriguing. The same method has been tried with the crystalline form of estrone. If this method of administration is proved through more experience it promises to relieve patients of the constant repetition of hypodermics.

Dr. H. M. N. WYNNE: If most of these patients are given stilbestrol for their comfort and a considerable percentage are more uncomfortable with this medication, why use stilbestrol for such patients?

Dr. C. J. EHRENBERG: Because stilbestrol is less expensive and because it has a high potency when given orally which avoids the constant repetition of hypodermics. If the patient cannot tolerate stilbestrol one can always stop it and return to the natural estrogens.

Dr. H. M. N. WYNNE: Over what length of time are you going to administer any of the estrogenic substances?

Dr. C. J. EHRENBERG: To menopausal from three months to three years. To other types of patients as long as one thinks it is necessary for the re-establishment of a balanced endocrine function.

Dr. C. A. MCKINLAY: The elevation of blood pressure noted by Dr. McKenzie would suggest further study as to the frequency of its occurrence. I would like to ask whether diastolic pressure was also elevated.

Dr. CHARLES H. MCKENZIE: In reviewing the literature I have attempted to discuss the good as well as the undesirable effects of this drug. Naturally those who have written about the drug are rather enthusiastic and do not as a rule stress its undesirable side effects.

In answer to Dr. Wynne's question I would say that the dosage of the drug may be gradually reduced and through time it may be discontinued and the patient will remain comfortable. My patient has gradually reduced the dosage from 10 mgm. to 1 mgm. a day, and I believe within the next month or so will be able to discontinue the drug.

In answer to Dr. McKinlay, the blood pressure at the present time is 144/80. The highest reading was 190/106.

Dr. R. T. LAVAKE: It is quite true that you can get changes in the vaginal tract with estrogenic administration, but that does not influence the question of the wisdom of such administration in the menopause. Just because we can bring about changes in the vagina, in or past the menopause, similar to those found in the menstrual cycles in youth does not justify the procedure.

The use of estrogenic substances, before the age when cancer is most prevalent, for the purpose of rectifying imbalance is quite another matter. Even here, however, it would seem that we should take reports with a grain of salt. When one product after another is listed as indicated in all of the following: amenorrhea, menorrhagia, metrorrhagia and dysmenorrhea, etc., and reports come out that in taking endometrial biopsies for various abnormalities of function one biopsy alone has cured many patients, it seems to me that we should keep both feet on the ground in evaluating the reasonableness of broad claims. In early life humans tolerate well the lack of estrogens. I have observed many castrates in the prime of life and in whom there was no lack of physical and mental vigor and elation. Some of the strongest and most intellectual men of the past were eunuchs, if we can believe history. The most important elements in the menopausal complex would seem to be the mental attitude toward the idea of aging and the general physical condition of the patient. Personally I prefer to solve the problem by psychotherapy, proper treatment of nutritional imbalance by high iron foods and vitamins, thyroid extract or iodine as indicated, and the use of harmless medical tonics and nerve sedatives. I am sure of the safety of such an approach and sure of the efficacy of such treatment, provided the patient is not basically a psychopath.

To liken ovarian secretion to that of the thyroid and the pancreas is to my mind a fallacy. One is a transient secretion, the absence of which does not interfere either with early life or with the other extreme of life. To liken estrogens to insulin and thyroid extract just because we have simple tests of their activity that are as accurate as those for the functioning of insulin and thyroid extract, again seems illogical. It is, however, not only logical but obvious that we should check administration by vaginal smears if our records are to be of the greatest value. Fortunately, vaginal smear technic is very simple.

It strikes me that we should be very cautious in evaluating the directional implications of the results enumerated in this excellent resume.

Dr. H. B. HANNAH: I have listened to this discussion and wondered if we were hearing testimonials at some sort of religious revival meeting.

About six or seven years ago, after a report came from St. Louis on the treatment of melancholia with estrone, Dr. Hamilton and I started to treat a series of patients with real melancholia. These people were really depressed and gave evidence of being definitely objectively ill with melancholia. They could not sleep at night, had many somatic delusions, and were extremely agitated. In other words, there was no question about these patients being psychotic and definitely suffering from involutional melancholia. These patients were in sanitariums and this gave us an opportunity to watch them and draw our own conclusions. A series of approximately 75 patients were thus treated with estrogenic substances, but we could not see that there was any improvement as a direct result of this treatment. After a considerable period of time, many of these patients did make some improvement but still patients with involutional melancholia do get better without any specific therapy.

About two weeks ago, I attended a meeting in one of the mid-western cities and the discussion of the treatment of involutional melancholia with estrogenic substances came up. The general consensus was that there was very little effect on involutional melancholia. Better results in pathological depressions have been obtained with metrazol shock therapy. Dr. Lloyd Ziegler, of Wauwatosa, reported a series of 105 cases. Ninety-five of this 105 have made a very remarkable improvement. Most of them had gotten well in six months.

My own conclusion has been that involutional melancholia, or the depression in the so-called change of life, benefits very little by estrogenic substances and that is also the opinion of most men who are working in the state hospitals.

Dr. C. J. EHRENBERG: Dr. Severinghaus said a short time ago, that until he could demonstrate a full estrogen effect in the vaginal smears in a number of involutional melancholia patients without improvement, would he be convinced that the estrogens were without value in this disease.

One cannot compare estrogen therapy of today with that of seven years ago as the preparations of that time were decidedly less potent.

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Dr. S. E. Sweitzer

Dr. G. W. Toomey
Dr. E. L. Tuohy
Dr. M. B. Visscher
Dr. O. H. Wangensteen
Dr. S. Marx White
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AMERICAN MEDICAL ASSOCIATION TRIAL

Inasmuch as the affairs of the American Medical Association must be conducted by delegated representation from the component county and state societies, individual members may not always be conversant with the details of administration and the complexity of problems as they arise in different parts of the country. Little wonder then if some should question the justification of certain official acts by their governing bodies, especially when politico-civic authorities attack the underlying motive in court.

It must have met with the approval of every such member to find that the *Journal* publishes the proceedings as the trial of the American Medical Association progresses in Washington. Those who with becoming modesty had wondered if their organization had deviated from that code of righteous conduct that was their child and pride were relieved upon reading the opening state-

ments of the prosecution and defense. It appears from this that they had not *violated* the golden rule, as we understand it, but were accused of *adhering* to it against the destructive forces of ignorance and greed. It's the same old story—this sinful world cannot understand our principles of ethics. It imputes selfishness as the motive for every act. Let us hope that the further reports will justify the confidence that we have in those who have been entrusted with this controversial subject.

A. E. H.

AMERICAN COLLEGE OF SURGEONS

Two Sectional Meetings which will interest the readers of the *JOURNAL-LANCET* have been planned by the American College of Surgeons. March 10, 11 and 12 have been set as the dates for the meeting in which the states of Minnesota, North and South Dakota, Iowa, Nebraska, Montana, Kansas and Wisconsin will participate; March 26, 27 and 28 have been designated for

the meeting for the states of Oregon, Washington, California, Nevada, Idaho, Wyoming, New Mexico, Arizona, Colorado, Montana and Utah. Headquarters for the first meeting will be at the Nicollet Hotel, in Minneapolis. The Hotel Utah in Salt Lake City will be host to the second meeting.

The approved hospitals of the cities in which the meetings will be held will provide excellent clinical background for the College sessions. Many of them will hold operative and non-operative clinics each morning during the meeting, and will also hold demonstrations of hospital procedures for the hospital executives who will attend the Hospital Conference which will be sponsored by the College. Distinguished surgeons from all parts of the country will address the scientific sessions and lead the conferences and panel discussions. At the headquarters hotel there will be educational and scien-

tific exhibits and showing of motion pictures portraying surgical and hospital procedures. Daily bulletins will be issued listing the various clinics, sessions, conferences and other events of each day. A large public meeting on the subject of "Conservation of Health" will be the final feature of both meetings.

The medical profession at large, as well as hospital trustees, superintendents, pathologists, dietitians, and other hospital executive personnel, are invited to attend the sessions of the Sectional Meetings and the Hospital Conferences, a sufficiently varied program having been arranged to interest members of the several professions which are concerned with service to the sick and injured.

A general outline of each program to be presented at the meetings will be found under "Future Meetings" in this issue.

E. A. P.

Book Reviews

Synopsis of Obstetrics, by J. C. LITZENBERG, Professor Emeritus of Obstetrics and Gynecology, University of Minnesota Medical School; 394 pages; St. Louis: C. V. Mosby Company.

DR. LITZENBERG's lecture notes for his course in obstetrics for the Junior class of the University of Minnesota Medical school have been edited, illustrated, and brought up to date to form this book. The field of obstetrics is well covered in outline form. Symptoms, signs, differential points, and methods of treatment are listed in sentences ready made for memorizing. The obvious use of the book is in preparation for various examinations—state boards, specialty boards, and the like. LITZENBERG follows the conservative school of obstetrics and his therapeutic recommendations and contraindications follow consistently that school.

The Diagnosis and Treatment of Diseases of the Esophagus, by PORTER P. VINSON, B.S., M.A., M.D., D.Sc., A.F.C.P., Professor of Bronchoscopy, Medical College of Virginia, Richmond, Virginia; Springfield, Illinois, and Baltimore, Maryland: Charles C. Thomas, Publisher. Cloth, price \$4.00.

DR. PORTER P. VINSON presents the results of his extensive experience in *The Diagnosis and Treatment of Diseases of the Esophagus*. It is an extremely practical book, as it is devoted to the clinical aspects of the subject.

One is impressed with the author's opinion that all cases of diseases of the esophagus do not need to be examined by means of the esophagoscope. He has a healthy respect for the dangers and difficulties of esophagoscopy and avoids it when possible.

By means of the swallowed string he is able to treat many conditions involving the esophagus and prefers this method, when possible, to the esophagoscope. This is quite opposite to the teachings of some other authorities, who use the scope first and only rely on the swallowed thread when unable to get the desired results by esophagoscopy.

The author, in discussing benign strictures of the esophagus dismisses the preventive treatment, by early use of bouginage, by stating he has not tried it.

This book should be read by all those interested in the subject. It is well written, nicely printed, not expensive and is highly recommended.

Complete Guide for the Deafened, by A. F. NIEMOELLER; 256 pages; New York: Harvest House; 1940.

The author has divided into a dozen groupings the topics that are engaging the attention of physicians who have to do with hearing defects. They are as follows: Statistics on prevalence of impaired hearing; physiology and anatomy of the ear; varieties of deafness; causes of impaired hearing; prevention of impaired hearing; symptoms of disorders of hearing; tests of hearing; re-education of the hard-of-hearing; re-educational aids, individual and social; organizations for the hard-of-hearing; problems of the hard-of-hearing; voice culture. The book is designed to indicate how to obtain the best medical advice on the patient's problem and self-help as well.

Minor Surgery, by FREDERICK CHRISTOPHERS, M.D., F.A.C.S., Associate Professor of Surgery at the Northwestern University Medical School, Chicago; fourth edition, reset, 990 pages with 639 illustrations; Philadelphia: W. B. Saunders Company; 1940. Price \$10.00.

An already excellent volume on minor surgery has been revised and brought up to date. Sections of the book have been rewritten such as those on varicose veins, thrombophlebitis, head injuries, acute osteomyelitis and others. The new developments on blood grouping, transfusions and blood banking and the postoperative management of the water and electrolytic balance have been added. The newer treatment of fresh wounds by soap and water and debridement and the factors influencing wound healing are fully discussed. The author feels that antiseptics have no part in the treatment of fresh wounds.

The value of zinc peroxide, urea, and sulfanilamide in the treatment of infected wounds is stressed. Sulfanilamide therapy is fully discussed. Its use in the treatment of compound fractures is unfortunately omitted. Long's tables of dosage of sulfanilamide are included.

The illustrations are simple and instructive and in many instances diagrammatic. The radiographs are excellent.

The only criticism that can be offered is that there may be a great deal included in the volume that may not be considered by some as fully in the realm of minor surgery but, of course, that would depend on the proper definition of the term "minor surgery."

The references to the literature are complete and up-to-date. The book is recommended as an excellent text and source of recent literature for the use of everyone doing surgery, both major and minor.

Future Meetings

AMERICAN COLLEGE OF SURGEONS Sectional Meetings

March 10, 11 and 12—Minneapolis, Minnesota
March 26, 27 and 28—Salt Lake City, Utah

GENERAL OUTLINE OF PROGRAM

Monday, March 10—Minneapolis

Wednesday, March 26—Salt Lake City

7:30 to 8:30—Registration and general information.

8:30 to 11:00—Operative clinics, general surgery and the surgical specialties.

10:00 to 12:30—Hospital conference.

11:00 to 12:30—Non-operative clinics, general surgery and the surgical specialties.

12:30 to 1:30—Medical motion pictures, general surgery.

1:30 to 3:00—Panel discussions (5).

2:00 to 5:00—Hospital conference.

3:00 to 5:00—Medical motion pictures, eye, ear, nose and throat surgery.

3:30 to 5:00—Panel discussions (3).

5:00 to 5:30—Meeting of Fellows.

5:30 to 6:00—Meetings: State Executive Committees. State Credentials Committees. State Judiciary Committees.

7:00 to 8:00—Medical motion pictures: General surgery. Eye, ear, nose and throat surgery.

8:00 to 10:00—Scientific meetings: General surgery. Eye surgery, ear, nose and throat surgery.

8:00 to 10:00—Hospital conference.

Tuesday, March 11—Minneapolis

Thursday, March 27—Salt Lake City

7:30 to 8:30—Registration and general information.

7:45 to 9:30—Hospital breakfast conference.

8:30 to 11:00—Operative clinics, general surgery and the surgical specialties.

10:00 to 12:30—Hospital conference.

11:00 to 12:30—Non-operative clinics, general surgery and the surgical specialties.

12:30 to 1:30—Medical motion pictures, general surgery.

12:30 to 2:00—Luncheon, Governors of the College.

1:30 to 3:00—Panel discussions (5).

2:00 to 5:00—Hospital conference.

3:00 to 6:00—Medical motion pictures, eye, ear, nose and throat surgery.

3:30 to 5:00—Panel discussions (3).

5:00 to 6:00—Medical motion pictures, general surgery.

7:00 to 8:00—Medical motion pictures: General surgery. Eye, ear, nose and throat surgery.

8:00 to 10:00—Scientific meetings: General surgery. Eye surgery. Ear, nose and throat surgery.

8:00 to 10:00—Motion pictures for hospital personnel.

Wednesday, March 12—Minneapolis

Friday, March 28—Salt Lake City

7:30 to 8:30—Registration and general information.

7:45 to 9:30—Hospital breakfast conference.

8:30 to 11:00—Operative clinics, eye, ear, nose and throat surgery.

9:00 to 11:00—Fracture clinic.

9:00 to 12:00—Cancer clinic.

10:00 to 12:30—Hospital conference.

11:00 to 12:00—Conference of State Fracture Committees.

11:00 to 12:30—Non-operative clinics, eye, ear, nose and throat surgery.

12:30 to 1:30—Medical motion pictures, general surgery.

1:30 to 3:00—Panel discussions (3).

2:00 to 5:00—Hospital conference.

2:00 to 6:00—Medical motion pictures, eye, ear, nose and throat surgery.

3:30 to 5:00—Panel discussions (3).

5:00 to 6:00—Medical motion pictures, general surgery.

7:00 to 10:00—Medical motion pictures, general surgery.

8:00 to 10:00—Meeting on Health Conservation.

News Items

Dr. A. L. Hammerel of Billings was elected president of the Montana Academy of Ophthalmol-Oto-laryngology at the convention held in Butte February 10. Dr. Fred Hurd, Great Falls, was elected secretary-treasurer. Dr. Earl Strain, Great Falls, and Dr. Russell Gwinn, Missoula, were made honorary life members. New members admitted to the academy are Dr. John Hammerel, Billings; Dr. T. F. Bush, Butte; Dr. Roy Key, Missoula; Dr. W. L. Forrester, Havre, and Dr. C. M. Hall of Great Falls. Dr. R. M. Morgan of Butte was made an honorary member.

Thirteen men were licensed to practice medicine and surgery in North Dakota recently. They are: Donald J. Cronin and Robert B. Woodhull of Minot; Jack T. Cowan and Frank J. Hill of Bismarck; Hans E. Guloiën, Leo A. Nash and Elvin L. Sederlin of Fargo; Jon O. S. Sigurdson of West Fargo; H. Ebenhardt Neve of Hope; Alvin J. Swingel of Mandan; Bernard N. Karleen and Hubert F. Flannery of Jamestown and Frederick J. Vollmer of Grand Forks.

Dr. R. O. Spittler, New Richland, Minnesota, was elected president of the Waseca county medical association recently. Dr. C. T. Wadd, Janesville, was elected vice-president.

Dr. William E. Linton, formerly of Los Angeles, California, is now in Madison, South Dakota, where he is assisting in the practice of Drs. R. S. Westaby and G. E. Whitson. Dr. Westaby is in California, recuperating from auto accident injuries.

Dr. Julian F. DuBois of Sauk Centre, Minnesota, secretary of the state board of medical examiners, was elected president of the National Federation of State Medical Boards at the annual meeting of the organization held recently in Chicago.

Nine Montana physicians have been appointed to examine out-of-school N.Y.A. youths, according to O. B. Lund, N.Y.A. area supervisor. Physicians examine all youths on N.Y.A. vocational programs in their county or area. Those appointed are as follows: Dr. D. J. MacDonald, Billings; Dr. Lindsay Baskett, Big Timber; Dr. James W. Craig, Circle; Dr. Eugene F. Noona, Wibaux; Dr. Irving J. Bridenstine, Terry; Dr. M. G. Danskin, Glendive; Dr. Thomas M. Morrow, Scobey, and Dr. Lyall S. Cray, Fairfield.

Dr. W. M. Meyer, Rollingstone, Minnesota, has taken over the practice of Dr. S. D. Whetstone of Winona. Dr. Whetstone has moved to Owatonna.

Dr. G. M. Williamson, Grand Forks, North Dakota, recently attended the thirty-seventh annual congress on medical education and licensure and the federation of state medical boards. He led the discussion on a paper by Dr. J. W. Holloway, Jr., of the bureau of legal medicine and legislation of the American Medical Association.

Dr. Patterson A. Waters, chief medical officer of the United States Veterans hospital at Fargo, North Dakota, has been named manager of the veterans facility, succeeding C. T. Hoverson, who reported for duty as lieutenant colonel of the 164th infantry. The appointment is for the duration of the period Hoverson is in service and Dr. Waters continues also as the chief medical officer.

Mrs. B. M. Hart, Onida, was elected president of the Fourth District Medical auxiliary to the South Dakota State Medical association at the meeting held in Pierre, February 24.

Hotel Carter will be the headquarters for the annual meeting of the Woman's Auxiliary to the American Medical Association which will be held in Cleveland, June 2-6, 1941. Requests for reservations should be sent immediately to Dr. Edward F. Kieger, chairman of the committee on hotels and housing, 1604 Terminal Tower Building, Cleveland, Ohio.

Dr. Jack Cowan, formerly of Bismarck, North Dakota, is now in Pierre, South Dakota, where he is associated with the Pierre clinic.

Dr. Wallace Cole, Minneapolis, Minnesota, head of the orthopedic surgery department of the University of Minnesota, sailed from New York January 15, to replace Dr. Philip Wilson of Boston as American orthopedic specialist with the British army medical corps.

Dr. J. F. Traxler of Henderson, Minnesota, was elected president of the Nicollet-LeSueur County Medical society and its auxiliary at the state hospital in St. Peter recently.

Dr. Curtis L. Wilson was re-elected president of the Butte Anti-Tuberculosis society at a meeting held February 12 in Butte.

Dr. C. T. Bergen of Blue Earth, Minnesota, has taken over the practice of Dr. H. W. Sybilrud at Brice-lyn. Dr. Sybilrud has been ordered to active duty with the second brigade, United States marine corps, at San Diego, California.

Dr. A. D. McCannel and his associates, Dr. Harmon Brunner and Dr. Donald Cronin, have moved into their offices in the new McCannel building, Minot, North Dakota.

Dr. Frederick J. Vollmer, eye, ear, nose and throat specialist of Howard, South Dakota, has become associated with the clinic of Drs. W. H. Witherstine and Leif T. Lohrbauer in Grand Forks, North Dakota.

Dr. Paul T. Cook, Valley City, North Dakota, was recently elected chief-of-staff at Mercy hospital in that city.

Dr. A. J. Welker, physician of Max, North Dakota, for 25 years, has joined the medical staff of the state hospital at Jamestown.

Dr. F. C. Kohlmeyer, formerly of Sarles, North Dakota, has taken over the practice of Dr. H. A. LaFleur of Lakota.

On the recommendation of the Committee on Fellowships and Awards, the Board of Regents of the American College of Physicians, by unanimous resolution, has voted that the John Phillips Memorial Medal for 1941 be awarded to Dr. William Christopher Stadie, associate professor of research medicine at the University of Pennsylvania, Philadelphia, for his significant contributions to the knowledge of anoxia, cyanosis and the physical chemistry of hemoglobin, and more especially for his recent studies on the subject of fat metabolism in diabetes mellitus. This award was established by the College October 27, 1929, to be given periodically for some outstanding piece of work in internal medicine. Internal medicine in this instance is interpreted to include not only clinical science, but all of those subjects which have a direct bearing upon the advancement of clinical science. The work must have been done in whole or in part in the United States or in Canada.

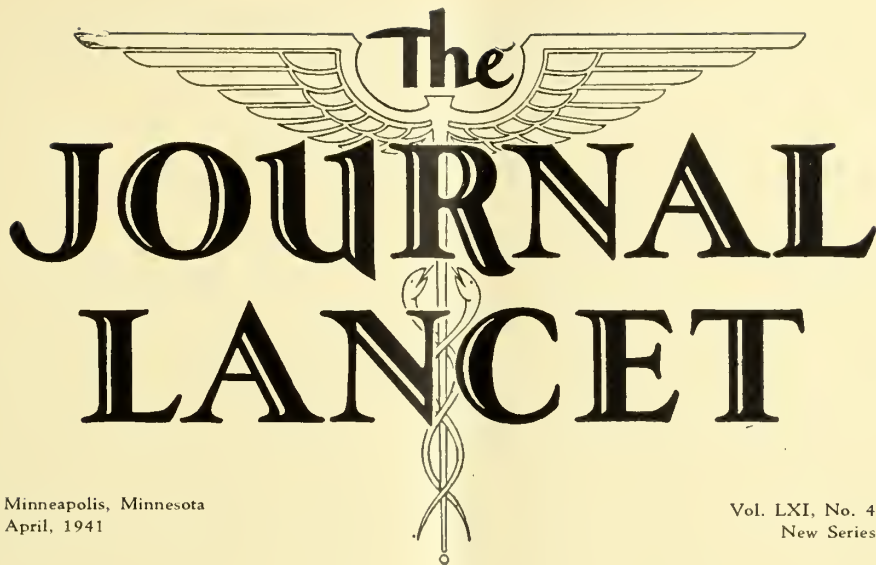
Necrology

Dr. Mark Dickens Hoyt, 72, Glasgow, Montana, died February 12, 1941. A resident of that region since 1891, Dr. Hoyt was the first physician in northern Montana.

Dr. Charles L. Roland, 70, Humboldt, South Dakota, died at his home recently. He had been president of the Sioux Valley Medical association and a charter member and past president of the Northwestern Medical society.

Dr. W. D. Beadie, Windom, Minnesota, died at his home February 7, 1941. For the past 17 years he was head of the Mineral Springs Sanatorium at Cannon Falls. He retired January 1 because of ill health.

Dr. John B. Walton, 59, Martin, South Dakota, died in Rochester, Minnesota, January 21, 1941.



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New Series

Early Diagnosis of Tuberculosis

Kendall Emerson, M.D.†
New York City, New York

One of America's most distinguished bacteriologists was told recently of the speedy death of a colleague from tuberculous pneumonia. His comment was, "How extraordinary! I examined his chest two weeks ago and it looked all right from the outside."

The story epitomizes our delay in conquering this disease. Too generally an external examination of the chest is taken as evidence of freedom from active tuberculosis. The physician who looks at the outside of a chest, percusses it, examines it with a stethoscope, is carrying out a commendable routine and one which often reveals certain pathological processes.

But he who today stops at that point exposes himself to a charge of malpractice. Instruments of precision, the tuberculin test and the X-ray, have imposed new obligations on the medical profession. At the same time they have furnished doctors with two of the readiest, simplest and most efficient diagnostic procedures in the medical armamentarium. No physician can safely dodge his responsibility to familiarize himself with them and to use them in the regular course of his practice.

The public health services and voluntary tuberculosis agencies over a quarter of a century have developed the technics of tuberculosis control. With government resources sufficient to put them into full operation the disease would disappear were it not for one as yet unsolved problem. This is *early diagnosis*. Here lies the private practitioner's great opportunity. With his aid as discoverer of the early case, before infection has spread, control of tuberculosis comes actually into sight.

The JOURNAL-LANCET makes its annual contribution to this great program for human welfare. Each practitioner who reads its pages will find there clearly delineated the part he may play in doing his bit to speed the day of victory.

†Managing Director, National Tuberculosis Association.

The Tuberculosis Situation in Peking

October 1940

T. L. Kuo†

Peking, China

PEKING—a city of nearly one and a half millions, walled and moated and still splendid with its thousand years of imperial dignity, even with the limited statistical figures available, shows itself to be fruitful soil for the spread of what was once one of the most dreaded “plagues” of Europe. Seventy-five thousand persons, or one in twenty, now living in this city, are estimated to be suffering from one or other of the active forms of the scourge of tuberculosis. This is almost ten times the percentage found in the United States.

Peking holds the responsible position of the medical leadership in China today, and is, moreover, equipped with a climate eminently suited to the arrest and treatment of pulmonary tuberculosis. It is a sobering fact that at the present time the city has only 300 beds to cope with this situation, over two-thirds of these being under the management of private practitioners. Due to the political changes of the past few years, the cost of living in Peking has risen to about five times what it was before the incident of 1937, while the amount of the individual income has at most only doubled. The private sanitariums available for tuberculosis patients are charging a monthly rate of over \$100 (Peking currency) for public wards, making it practically impossible for any family whose income does not exceed \$300 per month to take advantage of their help. There are, moreover, very few individual incomes in the city of Peking aggregating more than \$200 per month, and in many cases it is the young men and women who contribute to the earning power of the family who are themselves in need of sanitarium care. The members of these middle class families as well as the very poor are today facing the double problem of lack of accommodation and the expense far beyond what they are able to pay. Students and professional people, those to whom China must look for her strength and life in the days that lie ahead are too often found to be suffering from this disease and quite unable to get proper treatment.

In this ancient capital where the old East and the modern West meet, one can see all types of treatment for tuberculosis patients: at the one extreme, complete reliance on the use of herbs, a treatment as old as China herself, and utterly lacking in any really scientific knowledge of the disease and of the ways it is spread; at the other, as modern and scientific a treatment as can be found anywhere in the world today, that provided by the Peking Union Medical College, an institution established by the Rockefeller Foundation and foremost in

†Yenching University.

the field of tuberculosis research. The hospital attached to this institution, which was established for the purposes of research and education, is able however to accommodate only a very limited number of cases, and only those in the acute stages of other diseases. This is true also of the few mission hospitals available, which, limited as they are in capacity, feel that their first attention must be given to patients suffering from the more acute conditions. The ordinary patient, with no modern knowledge of the disease, when the early symptoms become evident usually either does nothing at all, or first seeks the advice of the herb doctor. And when acutely ill, he finally goes for help to those best able to help him. The pitiful shortage of beds usually means that he has to be turned away, to return to his home to spread the disease among his family members and co-workers until death comes.

During the past year an interesting experiment and study has been carried out by a Chinese physician trained for work in this field who undertook to see what he could accomplish in checking the spread of the disease by a scientific approach to a given situation. He took for his study a Chinese department store in the city, gave fluoroscopic examinations to each of its 200 employees from the manager himself to the most poorly paid servant, and found that 18 were suffering from tuberculosis in various stages and were in need of treatment. The manager became interested, and with his help a small sanitarium to care for these patients was opened in the Western Hills, some ten miles out of the city, where the air is dry and clean and fresh. The store undertook the full support of the patients undergoing treatment and in addition allowed them 15 months' full salary. By the spring of 1940, 16 of the 18 cases, some of them under pneumothorax treatment, returned to work. From the time of the original examination, no new employee was admitted without an X-ray of the chest, and a check-up examination of all employees conducted last May showed that there were no further cases in need of treatment.

Yenching University, one of the very few institutions of higher learning comparatively unaffected by the present changes in China, has long been troubled by the problem of tuberculosis among its students. A number of its highly-trained graduates have already been disabled by, or have died of, the disease. And each year there have been serious cases in the student body, with no place where they could receive proper treatment. This year, tests were given to the entering class, a group of 300, and of this group, fourteen (two girls and twelve

boys) had to be rejected because of moderately advanced pulmonary tuberculosis. Well over 5 per cent of the 300 were suffering from a minimal form of the disease.

The success of the experiment in the department store's sanitarium in the Western Hills has resulted in a coöperative effort which is being undertaken by a group intensely concerned with this problem of the provision of facilities for the treatment of tuberculosis and the checking of the spread of the disease. This group is made up of representatives from the Peking Union Medical College, Yenching University, and the department store, including Dr. S. T. Wang, superintendent of the Peking Union Medical College Hospital and Dr. Leighton Stuart, president of Yenching. It has pledged itself to the continuance of the sanitarium for the treatment of patients from any of the three institutions. Physicians in the Peking Union Medical College and in Yenching have promised to give their skill. The store will give the building and many of its furnishings. Patients will pay for their own food and ordinary medicines except in cases where they are quite unable to do so. There is needed additional financial backing to keep the treatment within the reach of those for whom it is intended. Support is also urgently needed to enlarge the work already begun by opening additional sanitariums that shall care not only for those connected with these institutions but for other sufferers as well. Care for a student, a teacher, may mean the saving of a life that may make a valuable contribution to China. It

means more than this. It means also that people who otherwise would have been infected shall go through life untouched by the disease; for every sufferer from this scourge is the potential source of infection for tens and hundreds of others with whom he may come in contact. The only way to check it, is to give adequate hospitalization for those who may spread it. Surely this project offers a unique opportunity for those who wish to make their contribution to China not only in the relief of suffering, but in the salvaging of lives of incalculable value for the building of the China that is to be.

The physician who conducted the experiment in Tientsin Department Store is this year on the staff of Yenching University and he is eager to use the University as the center for an experimental program of tuberculosis control. The Yenching community, including staff, students and servants, consists of well over 2,000 people and offers a unique field for such an experiment. Unfortunately the work is seriously handicapped by the lack of a small shock-proof X-ray unit, costing in the United States about \$2,000. Such a unit is quite necessary for routine X-ray examination of each member of the community plus frequent follow-up films for those who are suffering from tuberculosis, and would also be of great value to the patients in the sanitarium, only 4 or 5 miles away. In the United States \$2,000 seems a small amount when one considers what it would mean for the scientific study of tuberculosis in a situation so admirably adapted to such a study.

TUBERCULOSIS AND MEDICAL PREPAREDNESS

So far as tuberculosis is concerned, the cost in the last war has been at least \$959,000,000 just for vocational training, insurance, compensation and hospital care. This figure does not include the cost of hospital construction. Today money is being spent at the rate of \$3,000,000 a month on tuberculous soldiers. Flatly, it costs around \$10,000 to induct a man suffering from tuberculosis and \$50.00 a month for the rest of his life, plus compensation benefits for his dependents after his death. When you compare the above figures with the slight cost of making X-rays of the chests of all draftees it is only reasonable to believe that a considerable saving can be effected by the use of the X-ray. In addition to all this, we haven't counted the damage that the tuberculous soldier does in his contact with the other soldiers.

DONALD B. CRAGIN, M.D.,

President, Association of Life Insurance Medical Directors.

Various Tuberculous Lesions in One Family Group*

Edwin J. Simons, M.D.

Swanville, Minnesota

IN a rural practice, the most practical way of attempting to determine the source of tuberculous infection and its dissemination is the tuberculin testing of the family and contacts of each known case of tuberculosis. For some years this method has been used and has demonstrated interesting and, in some cases, bizarre results. In the present instance, both initial and healed primary lesions were discovered as well as both the active and healing adult destructive types of lesions.

Further interest in the group is engendered by coincidental, spontaneous pneumothorax and marked generalized emphysema. In spite of these current developments, artificial pneumothorax has been quite effective in one case.

The first patient, Mr. F. C., 28 years old, first presented himself for diagnosis on March 17, 1939. His complaints dated back to "a cold" two months previously and consisted of cough, expectoration, night sweats, fever, tired feeling, dyspnea and loss of weight, strength and appetite. On examination his pulse rate was 100 and his temperature was 101 F. Crepitant and sibilant inspiratory rales were heard generally over the right hemithorax, especially over the upper portion. A Mantoux test was applied and two days later was found to be negative. Sputum examination demonstrated tubercle bacilli. His hemoglobin and white blood cell count were both normal, but the sedimentation rate by the Cutler method was found to be a vertical curve, or 28 mm. in one hour.

An X-ray film of his chest taken at the time, March 17, 1939, according to a roentgenologist's interpretation, showed a fusion of the first and second right ribs and a congenital absence of a portion of the left first rib. There was diffuse mottling scattered throughout the right lung from apex to base, but the area above the first rib on the right was not easily visualized (fig. 1). From the middle third of the right third rib an area of spontaneous pneumothorax extended outward and downward to the sixth rib. It appeared that the right diaphragm was higher than normal. The left hilum was enlarged and some mottling was seen in the left first, second and third intercostal spaces.

With these findings, a diagnosis of far advanced, active pulmonary tuberculosis was made and the patient was referred to Fair Oaks Lodge Sanatorium where Dr. W. S. Broker instituted pneumothorax treatment of the right lung. During the course of pneumolysis the patient developed a marked emphysema of the head, neck, arms and thorax.

An X-ray film taken on November 11, 1940, as interpreted by a roentgenologist, showed satisfactory collapse of the right lung with the possible exception of

*Read before the Lymanhurst Medical Staff, Minneapolis, Minnesota, March 18, 1941.

the tissue involved in an adhesion from the right hilar region to the apex. This film also confirmed the elevation of the right diaphragm as noted in the original film, for in the original, the diaphragm extended up to the sixth rib, whereas, in this film it extended to the seventh rib only (fig. 2). This impression is further verified by other films taken before the pleural effusion seen in the right base appeared. On the left side, less mottling was found in the first, second and third intercostal spaces and distinct calcium deposits were seen in the left hilar region.

This case illustrates active, far advanced pulmonary tuberculosis with congenital malformations of the ribs, spontaneous pneumothorax, pleural adhesions, pleural effusion and marked emphysema developing in the course of pneumolysis and pneumothorax treatment, which nevertheless, was successful in spite of the emphysema.

After active tuberculosis was demonstrated, all of the members of the patient's family and his hired man were subjected to the tuberculin test. All of them, the patient's mother, wife, three children and the hired man reacted positively. The X-ray film of the latter was entirely negative. But the film of the patient's mother, a woman of 60 years, showed mottling or infiltrations in the right apex, first and second intercostal spaces. According to the roentgenologist, it could not be positively stated whether these infiltrations were the beginning or the receding lesions of tuberculosis (fig. 3). She remained symptom-free, and physical and laboratory examinations were all negative. An X-ray film taken a year later showed the infiltrative areas to be still smaller. So the roentgenologic conclusion was that this case illustrates healed or healing adult destructive type of tuberculous lesions.

These two cases, then, may be said to represent the cycle of adult destructive pulmonary tuberculosis—the active, far advanced lesion and the spontaneously healed or healing lesion. The last case, however, introduces the problem of tuberculosis in elderly persons, for it provides a possible source of the disease for the first patient.

As said before, the Mantoux tests of the children, Donald, age 1½ years, Dennis, age 3 years, and Joan, age 4 years, were all positive. X-ray films of each of these children showed active primary lesions. That of Donald, age 1½, was obscured by movement. Nevertheless, opacities were seen in the left hemithorax in the region of the third, fourth and fifth ribs and also above and lateral to the upper left cardiac border. The same areas were seen in subsequent X-ray films taken six months later, but in these the lesions were smaller and less distinct.

In the case of the oldest child, Joan, age 4, the X-ray film taken on April 19, 1939, showed a rounded area of



Fig. 1. Thoracic film F. C., March 17, 1939. Note congenital malformations of first ribs both sides, tuberculous infiltrations throughout right lung, and spontaneous pneumothorax on right side. Active adult destructive tuberculosis.

Fig. 2. Thoracic film F. C., November 11, 1940. Note artificial pneumothorax, adhesion to apex, and pleural effusion on the right.

density about the size of a large walnut at the sternal end of the right third rib, and occupying the lower and upper half respectively of the second and third intercostal spaces in the mediastinal region. The activity of this lesion can not be determined from this single film. But a film taken eleven months later, on March 11, 1940, proved definitely its activity. This film showed a much larger triangular area with the base in the lower right hilar or mediastinal region and with the apex extending laterally to within an inch of the right lung periphery under the fourth rib. An X-ray film taken January 20, 1941, showed almost a complete disappearance of this lesion. All three of these films, that of Donald and the two of Joan illustrate active first infection types of lesions.

Perhaps the most interesting, at least speculatively, is the case of Dennis, age 3. He had slept with his father for about six weeks prior to the finding of tubercle bacilli in his father's sputum. When first seen, he was free of symptoms and had no abnormal physical findings. His Mantoux test, however, was positive. His first thoracic film, taken on April 19, 1939, had as its most significant finding a triangular mottled opacity in the right lung with the base at the hilar region and extending along the mediastinum from the sternal ends of the second to the fourth ribs and the apex extending about two inches laterally under the fourth rib. This lesion

was thought to be an active first infection tuberculous one. Progress was satisfactory until six months later, October 23, 1939, when the mother brought the patient in, stating that for the preceding week the boy had had a cough, fever, night sweats and loss of appetite. The temperature was 99.6 F., the pulse rate 116 and dulness but no rales could be found throughout the base of the right lung. The white blood cell count was 4,600. An X-ray film taken at this time showed the whole right lower lobe opaque and it was felt that the patient had a tuberculous pneumonia.

Six days later, the child was brought in with higher fever, vomiting, repeated night sweats, increased cough and pallor. The temperature was 103.6 F. rectally, the pulse rate 170, and the respiratory rate 44. The white blood cell count was 26,000. Dulness and absent breath sounds over the whole lower half of the right chest were found. The mottled appearance of the lesion at the right base had increased as had also the extensiveness of the lesion. Throat swabs were taken and revealed no tubercle bacilli or pneumococci but some short chain streptococci. It was thought that the child had a pleural effusion and possibly a non-tuberculous pneumonia superimposed on the original tuberculous pneumonia.

While it is not proper to incriminate others in giving diagnostic impressions, the opinions of roentgenologists and the best authority on tuberculosis have been ob-



Fig. 3. Thoracic film Mrs. S. C., mother of F. C., April 19, 1939. Note mottling in right apex, first and second intercostal spaces. Healed or healing adult destructive tuberculosis.



Fig. 4. Mrs. F. C., September 16, 1940. Ghon tubercle of healed first infection tuberculosis seen peripherally under right third rib.

tained. It is these opinions rather than mine which are presented.

Gastric expressions were obtained and these were negative for tubercle bacilli. Two weeks later the temperature had decreased to 99.6 F., the pulse to 116, the respiratory rate to 24 and the white blood cell count to 18,600. Cough, fever and night sweats had improved markedly and the child was looking and eating better. An X-ray film taken at this time showed a less mottled appearance of the lesion at the right base, and also a linear demarcation extending downward and laterally in the sixth intercostal space which was interpreted by the roentgenologist as a fluid level. From about this time on the child experienced uninterrupted clinical improvement. Roentgenologic disappearance of the lesion, however, was interesting. An X-ray film taken January 16, 1940, approximately three months after the more acute symptoms appeared, showed a much less extensive shadow in the right base, more of a mottled appearance of the shadow, and complete disappearance of the linear fluid shadow seen in the previous film. Two months later, an X-ray film showed some residual opacity in the base of the right lung. This shadow was triangular with the apex pointed peripherally. It was less mottled than that of the previous film and calcium was beginning to deposit in the right hilar region. The X-ray film taken on September 16, 1940, about 11 months from the acute episode, showed almost a complete disappearance of the opacity in the right base. However, deposition of calcium in the right hilar region and some mottling in the sixth right intercostal space were still apparent. An

X-ray film taken January 28, 1941, showed practically complete disappearance of the initial lesion.

This case exemplifies the development, course and regression of tuberculous pneumonia, one of the initial manifestations of the childhood or first infection type of tuberculosis. It is interesting to speculate on whether the acute clinical picture described was due to the development of the pleural effusion or to a superimposed non-tuberculous pneumonia.

Finally, the wife of the first patient and mother of the three children discussed was symptom-free, but had a positive Mantoux test. Her initial and subsequent X-rays showed increased peribronchial markings in the left first, second and third intercostal spaces with an enlarged left hilus showing some calcium deposits (fig. 4). On the right side, a Ghon tubercle was seen peripherally under the third rib. These findings represent the healed terminal lesion of first infection tuberculosis.

SUMMARY

1. By Mantoux testing of the family and contacts six cases of pulmonary tuberculosis in one family were discovered which demonstrate every type of tuberculosis discovered in practice.

2. The first case illustrates the active, far advanced adult destructive type of tuberculosis with the coincidental finding of anomalous ribs and spontaneous pneumothorax. It also demonstrates the effectiveness of artificial pneumothorax, in spite of extensive emphysema.

3. Spontaneously healed or healing adult destructive tuberculosis is illustrated in the second case. This case also typifies the question of the epidemiologic seriousness of undiscovered, symptom-free lesions in elderly persons.

4. Active, first infection type of lesions are seen in the third and fourth cases.

5. The fifth case demonstrates tuberculous pneumonia

as one form of primary or first infection type of tuberculosis. Its development and healing as well as the advent of pleural effusion and possibly the superimposition of other pyogenic pneumonia are seen.

6. Spontaneously healed first infection type of tuberculosis is demonstrated in the sixth case.

7. Thus, the pathogenesis or life cycle of human tuberculosis is exemplified in these six cases.

Tuberculosis Among Student Nurses

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THE problem of tuberculosis among nurses, especially student nurses in general hospitals with or without affiliated tuberculosis units, has received widespread attention, particularly during the past fifteen years. It has been felt that the young student nurse group is potentially the most vulnerable group among the hospital personnel by reason of sex, age, opportunities for infection and intimacy of contact. Consequently this challenge has resulted in many institutions in: (1) the adoption of case finding programs designed to detect clinical tuberculosis in its early stage which prognostically is the most favorable one when adequate treatment is begun promptly; (2) the adoption of methods to minimize the risk of infection.

CASE FINDING PROGRAM

We wish to present rather briefly our efforts in these directions. At the Jersey City Medical Center, which has a large student nurse body, there has been made in the past six years a determined and systematic attempt in the early recognition and control of tuberculosis among these young women. This project was an outgrowth of a health program for nurses which was started in 1926 by Doctor George O'Hanlon, Medical Director. Routine chest X-rays of the nurses was inaugurated in December, 1934. These films have been repeated every four months and more often when indicated. Routine tuberculin testing was begun in March, 1934, and has been carried out by Dr. A. Jaffin, Chief of Clinics. All nurses on entering the Training School have been tuberculin tested. The negative reactors have been retested annually. During the first four years of the X-ray survey, several wards were set aside at the Medical Center for tuberculous patients. Student nurses spent approximately two weeks on the Service, and most of them received their ward training during the second

year. In December, 1938, the Service at the Center was transferred to the new Hudson County Tuberculosis Hospital. We are now undertaking a two months period of affiliation with an intensive teaching program for student nurses in their senior year. So much for the historical note.

WHAT HAVE BEEN OUR RESULTS?

(1) *What has been the incidence of tuberculous infection?*

Of the classes that entered in 1934 to 1937 inclusive, 60 per cent had a positive tuberculin test on admission and 83 per cent were positive reactors at graduation or at the end of three years. It is interesting to note that there has been a progressive drop in the infectivity rate at graduation for each of these classes. Thus for the group that entered in 1934 and graduated in 1937, the positive reactors were 95 per cent; the other percentages were 89, 79 and finally 70 per cent for the last class which was admitted in 1937 and graduated in 1940. Another important point is that the overwhelming majority of students showed this conversion from negative to positive during the first and second years and before they had their course of duty on the Tuberculosis Service. This confirms the oft repeated statement that no significant relationship can be discovered between the first positive tuberculin test and the character of the preceding service in a general hospital. The Tuberculosis Service appeared no more related in this respect than other hospital services. The unsuspected and undiagnosed case of open tuberculosis on the general ward of a general hospital is still the greatest source of danger. Of course, there was no way of learning how many students may have received their first infection outside of the hospital domain.

(2) *What has been the incidence of clinical tuberculosis?*

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During the six year period, out of 699 student nurses examined periodically by X-ray, 13 or 1.85 per cent developed *active* tuberculosis contracted *during their period of training*. Twelve or 92.3 per cent were early or minimal cases when the diagnosis was *first* made— included among this number is one case of pleural effusion—and only one or 7.7 per cent was a moderately advanced case (with a small cavity). The latter patient received artificial pneumothorax. Two of the minimal cases showed progression on a bedrest regime, and artificial pneumothorax was induced. The remainder have been treated by bedrest. Nine are working, two are convalescing at home and will soon be able to resume their duties and the last two diagnosed are in the hospital.

The value of frequent periodic X-ray examinations in the detection of early tuberculosis is inestimable. Results such as we have mentioned speak for themselves. It should be emphasized that in all of these cases, the diagnosis was made on a roentgenogram before the individual presented herself for examination.

We shall try to answer some of the common questions that arise in a discussion of this subject. (a) "How many of the student nurses who developed a lesion had their training on the Tuberculosis Service before the disease manifested itself?" There were only two in our group of thirteen. (b) "Were those nurses who had a negative tuberculin test on admission more prone to develop tuberculosis than those with original positive reactions?" We are aware that a number of investigators have reported that the original negative reactor has a much greater chance of contracting clinical tuberculosis than the positive one. We can only say that according to our own experience, the findings have been as follows among the thirteen nurses: 7 were originally positive reactors, 5 negative reactors, and in 1 the tuberculin test was not done. Tuberculous infection is only one factor, although an essential one, in the combination which makes for the reinfection type of tuberculosis. There are other factors, not measurable, such as dosage and virulence of the organism and general resistance of the individual which influence the development of the disease. (c) "Is working in a tuberculosis institution a hazard for the student nurse?" It should be said at the outset that the practice of nursing and medicine as a whole is in a sense a potential hazard to personal health. There are a number of instances where nurses and physicians have developed other diseases in the line of duty—as for example, the acute exanthemata, pneumonia, influenza (pandemic of 1918), typhus fever, malaria, yellow fever and septicemias and syphilis contracted by accidental inoculation with infected instruments. These risks are taken for granted and apparently do not detract young men and women from entering these professions. We must not forget also that the age group represented by our student nurses is the group in which one would expect a high tuberculous mortality and morbidity. Regardless whether young women between the ages of 18 to 25 are nurses or not, a certain

percentage will develop the disease. Mortality figures among females between 18 to 25 in New York City, for example, indicate that tuberculosis accounts for 30 per cent of all the deaths. By virtue of our intensive case finding program and the institution of prompt appropriate therapy, there has been not a single fatality among the 13 student nurses detected since our survey began in December, 1934. Thus, as concerns mortality statistics, nursing is not a serious occupational hazard for our students.

What about the morbidity from tuberculosis? We found, as noted previously, an incidence of 18.5 per 1,000. How does this compare with the incidence among young adult females of the same age group in the general population? There have been relatively few such control studies reported. In evaluating statistics for comparison one must bear in mind a very important consideration, namely—what was the yard stick employed in detecting pulmonary tuberculosis? It is readily understandable that the keener the diagnostic standard used, the higher the incidence of the disease.

May we cite a few examples?

Stiehm in 1935 reported that in 14 years at the University of Wisconsin prior to the establishment of case finding by X-ray, an average of 10 cases of tuberculosis per year was discovered. Then during the first year that the X-ray survey was introduced 43 cases were found, or an increase of 430 per cent over the 14 years average. The New York Telephone Company takes chest X-rays of its employees when indicated by clinical examination. McSweeney found an incidence of 0.9 per 1,000 in their female workers in the ages between 20 to 30 years. Now among the female clerical workers of the Metropolitan Life Insurance Company who received pre-employment and routine fluoroscopic examination of the chest annually, Dr. Fellowes reported in 1934 that the incidence in the same age group was 4.3 per 1,000 or almost 500 per cent higher than among the employees of the telephone company. Is it not, therefore, logical to assume that perhaps our higher incidence of 18.5 per 1,000 may be attributable in part at least to the fact that we are using a more sensitive diagnostic method than any of these organizations—a method which consists of periodic examinations three times annually by X-ray film and not by fluoroscopy once annually?

METHODS TO MINIMIZE THE RISK OF TUBERCULOUS INFECTION

(a) The routine use of B.C.G. vaccination in uninfected student nurses, as suggested by Heimbech, cannot as yet be accepted as the solution.

(b) Routine chest X-ray examinations of all new admissions to a general hospital would be an ideal method for the purpose of diagnosis and segregation of tuberculous patients, and thus decrease the health hazard for nurses. This procedure may not be so far off after hearing reports in the past year on the increasing use in large scale survey work of 4 x 5 chest X-rays at a very low cost. However, during the past few years there has

developed a greater tuberculosis conscious attitude among our own professional personnel. Patients admitted to the general wards have been fluoroscoped and X-rayed much more frequently than previously—the idea that active tuberculosis may be present with relatively slight symptomatology or signs has taken hold—and consequently more infectious cases have been detected in the general hospital of the Medical Center. These patients have been promptly transferred.

(c) The question has frequently arisen as to the advisability of the establishment of a definite communicable disease technic in a tuberculosis hospital. While this may be desirable it is not practical in a hospital like ours. In order to carry out such a technic effectively, all patients must be kept in bed. In our institution, there is a variety of activity on the various floors. Some are bed patients, others have bathroom privileges and graded exercise, some go to religious services, to the movies, etc. Therefore, an absolute contagion technic is not feasible. We have, however, inaugurated

a modified technic to be used by nurses—with particular emphasis on proper apparel or gowns for nurses, the use of a mask when working at the patient's bedside, the necessity for frequent washing of hands, and proper collection and disposal of sputum. This technic has been outlined in considerable detail and conforms with the best hygienic standards.

Thus, we feel that in being able to provide student nurses with a sensible precautionary regime, buttressed by the vigilance of our case finding program, phthisisophobia may be dispelled. These young women are coming to us now to utilize our enlarged educational and clinical facilities, and by the knowledge and nursing art thus acquired, raise their stature in the profession.

We are profoundly grateful to Dr. George O'Hanlon, Medical Director, Miss Jessie Murdoch, Directress of the Training School of the Medical Center, and Dr. Felix Fuld, Health Director, for the excellent coöperation given our project.

Complete Community Surveys for Tuberculosis*

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SINCE 1937 we have surveyed the entire population of four St. Louis County townships for tuberculosis.^{1,2} The population of the communities studied was 1,362. We made a house-to-house canvass and attempted to interview every individual in the community. Tuberculin tests were given to everyone, using the usual first-strength dose of .00002 mg. of P.P.D. The tests were read in 48 hours and nonreactors were given a second test using half the usual second-strength dose of P.P.D. or .0025 mg. All positive reactors were taken to the Sanatorium in buses for X-ray examination. Single 14 x 17 inch celluloid films were used.

Eighty-eight per cent of the whole population was adequately examined; that is, they had either a chest X-ray or a negative second-strength tuberculin test. Our work improved with experience so that in the last two townships surveyed, 91 per cent and 95 per cent of the population was satisfactorily examined. Some of the remainder had negative first-strength tuberculin tests, which in our experience practically rules out clinically important tuberculosis in apparently well persons. A part of those who were not examined were away from the community at the time the survey was made.

Fifty-three per cent of the persons tested had positive

tuberculin reactions. Eighty-four presumably tuberculous pulmonary lesions that appeared to be inactive were discovered. These cases have had repeated X-ray examinations and, in many instances, further clinical investigation. Seven previously unknown cases of active tuberculosis were discovered. Only one case had far advanced disease. These seven cases were all immediately hospitalized and treated and have now all been discharged as arrested cases of tuberculosis. The cost of these surveys, including salaries, transportation, depreciation of X-ray equipment, and all incidentals, was approximately \$4,000. We well realize that such a sum would probably have produced more active cases if it were expended on a selected low-income group such as relief clients or inhabitants of transient camps.³ However, we feel that these surveys taught us some lessons that are probably well worth \$4,000.

The ultimate aim of all antituberculosis work should be eventual eradication of the disease. At present there are two widely used methods of attack: first, the isolation and treatment of active cases, and second, the examination of contacts in an effort to find cases early before they can spread the disease to others. There are, however, a few facts which make us doubt that contact examination and isolation of known cases will ever make tuberculosis a negligible health problem. Many cases of

*Read before the Lymanhurst Medical Staff, Minneapolis, Minnesota, February 25, 1941.

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tuberculosis give no history of contact with the disease.¹ In a considerable number of such cases, examination of all close associates fails to reveal an antecedent case. The reason for this state of affairs is ordinarily obscure. Perhaps more or less casual contact is often of more significance than we generally assume. In older patients an unrecognized contact may have long since been broken, often by the death of the antecedent case. At any rate the frequent occurrence of cases without demonstrable contact shows us that contact examination must necessarily be ineffective in finding all cases of tuberculosis early.

As we would expect from such considerations, even in areas such as St. Louis County where a rather efficient system of contact examination has been practiced for years, more than half the new cases of tuberculosis are not found by contact follow-up but are reported by private physicians to whom they come because of symptoms.

We may then assume that examinations of contacts alone will probably not find a very high percentage of the cases of tuberculosis in a community at an early stage. If we search for a supplementary method, we are forced to the conclusion that only a tuberculosis survey of the entire community, repeated at intervals, offers any prospect of finding most cases of tuberculosis early. Until recently such an ambitious project was entirely impractical because of the tremendous cost of X-raying large numbers of people. However, with the development of miniature films, community surveys on a large scale become feasible, and indeed, have already been started.^{6,8} The general application of such methods might be expected to make tuberculosis a minor problem within a generation and would probably cost less than the eradication of typhoid fever by the provision of safe water supplies. Our experience shows that, at least in our county, the public will respond to such surveys on a voluntary basis in sufficient numbers to make the surveys adequate.

Our rather limited experience may also warrant some tentative conclusions as to the proper technic for the

community survey. We consider that a house-to-house canvass is probably essential. In several places in this country and abroad, community surveys have been made on what might be called an invitational basis. That is, after a period of publicity and advertisement, the people have been invited to present themselves for examination. About 50 to 65 per cent of the population may be expected to respond to such a campaign if it is well conducted, but such a yield does not seem sufficient.^{3,4,5,7,9,10}

We feel that the examination must be free. Any cost is a deterrent and even a small fee will discourage the low-income group. It is especially important that this group be examined completely because among them tuberculosis is most frequent. Adequate X-ray diagnosis by someone with extensive tuberculosis experience is essential if minimal lesions are not to be overlooked.

CONCLUSIONS

1. Community surveys offer a promise of eventual eradication of tuberculosis.
2. There are matters of survey technic that are important to insure good results, in the same way that adequate surgical technic is essential for good operative results.

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Tenth Annual Report of the Tuberculosis Committee, American Student Health Association For the Academic Year 1939-1940*

THE colleges and universities of the United States and Canada are becoming increasingly "unfair to tuberculosis"! Institutions of higher education are demonstrating that they recognize an obligation to safeguard and improve campus health. This is a point at which actions speak louder than words, and the Tenth Annual Report of the Tuberculosis Committee is privileged to relate determined action on the part of the colleges such as no previous Report, no matter how encouraging, has been able to record.

For the academic year of 1939-1940 we note 248 colleges with some form of tuberculosis control. Necessarily, where a new movement is gaining annually many new adherents, the character of individual programs must vary from most elementary to long-established and efficient. The phenomenal increase in cooperating schools is well brought out by table I, where it is seen that in

the latest and most approved outline of workable institutional tuberculosis case finding. Clinical innovations are numerous and frequent, some of them improvements of older technics, some of them new departures of unproved merit. Later, we shall re-state the fundamental principles to which we remain dedicated, since a large portion of our correspondence deals with questions from health service physicians not clear as to the relative advantages of various diagnostic aids. The second responsibility of the Committee is to encourage interest in case finding through the medium of the scattered sectional meetings of the American Student Health Association. On paper this sounds like a fine opportunity to secure the cooperation of section officials in so arranging their annual programs as to include papers, round tables and demonstrations on the subject of student tuberculosis. Actually, it is a limb of our tree that produces little fruit. We are of the opinion that success will not be achieved until every section president appoints a well informed, hustling tuberculosis sub-chairman to keep in touch with local executives, the main Tuberculosis Committee, and the state, city or county tuberculosis societies. Such integration is urgently needed if we believe that local control smacks of the American tradition, and that it promises better understanding and quicker solution of local problems than can distant direction and remote suggestion. Only in some such intimate fashion can the large number of non-cooperating colleges be reached.

TABLE I.
Colleges and Universities with Tuberculosis Case Finding,
1931-1940

Year:	Number Reporting Tuberculin Testing	Number Reporting Some Tuberculosis Program
1931 - 32	6-10 (Est.)	
1932 - 33	12	
1933 - 34	38	
1934 - 35	42	
1935 - 36	28 (x)	
1936 - 37	91	104
1937 - 38	116	133
1938 - 39	143	165
1939 - 40	213	248

(x) Incomplete returns.

1932-33 there were but 12 colleges or universities possessed of any tuberculosis set-up. The figure has gone up rapidly, having increased in the past twelve-month no less than 50 per cent over the preceding year. Lest we become too self-congratulatory, however, it should be acknowledged at the outset that there are 629 other schools on our mailing list so far with no programs under way. About 30 of these write hopefully of starting the work this year, but the main mass stands as both a challenge to our persistence and an appeal for aid and moral support. A pessimist might point to the fact that 402 schools neglected to return our questionnaires this year, but an optimist would show pleasure and appreciation because 193 more colleges replied than did so before the last report. Educators are waking up!

The duties of the Tuberculosis Committee fall into three divisions. First, there is the responsibility for presenting to member colleges and other interested schools

*Presented at the twenty-first annual meeting of the American Student Health Association, at the University of Michigan, Ann Arbor, Michigan, December 27-28, 1940.

Thirdly, the Committee collects, analyzes and publishes the statistical data secured as the result of returns from colleges taking part in the national survey. A very large share of the report concerns itself with this phase of our work, and it is upon the experience of past years that we are able to map plans for the future, as well as to trace the growth in quantity and rise in quality of college tuberculosis control. Before this communication reaches a stage where we must mention numerical facts, it is necessary that we stress again that these data are submitted by hundreds of different people, accumulated under widely differing conditions, and some of them open to criticism by any strict statistician. In fact, we are forced each fall to discard a certain small number of returns as being too far toward one or other extreme of probability to justify their inclusion. Usually this happens in connection with the inauguration of programs. Seldom does it occur in subsequent reportings, once the new project has "settled down." As soon as figures approximate the predictable levels for that region they are used along with those from sister colleges. If this minor reservation may be borne in mind, it will be appreciated that our methods do not vary from year to

year, but that we manage to preserve a fairly uniform system of analysis without being unduly arbitrary about our approach. And, as often stated in the past, we intend that our report figures shall be indicative of trends in certain directions rather than viewed as pontifical mathematical pronouncements.

During the 36th annual meeting of the National Tuberculosis Association in Cleveland, Ohio, last June, there was held the Seventh Annual College Hygiene luncheon. This was presided over in deft and able fashion by Dr. Oscar Lotz, executive secretary of the Wisconsin Anti-Tuberculosis Association. A paper: "Do College Students Have Tuberculosis?" was presented by Dr. J. A. Myers, Professor of Preventive Medicine at the University of Minnesota, a past president of the N. T. A., and a member of the Tuberculosis Committee since its inception. The meeting was well attended, the paper was excellent and provoked lively and prolonged discussion. The address is being published in the *American Review of Tuberculosis*, and reprints are to be available through the kindness and generosity of the N. T. A. Already plans are under way for a similar luncheon during the forthcoming sessions in San Antonio, Texas, in May, 1941.

Those who filled out this year's questionnaire will remember that it is now in a much simplified form. Several queries of lesser importance appearing on previous sheets were dropped, while some that required the keeping of complex records were eliminated. Without feeling that the present form is perfect, we hope to retain it unchanged for awhile, as we consider it ideal for the purposes of the Committee, and, through the latter, the reciprocal information of the colleges. No data now asked for will demand involved filing or call for more than a few moments' time to answer the questionnaire.

Briefly, the face of the form asks the name of the college, its enrollment, the number of students tuberculin tested, the number of positive reactors, the number of cases discovered, the disposition of the cases, and the amount, if any, of non-student tuberculosis found. Returns are divided by sex. This year, too, provision is made for the inclusion of students tested or X-rayed elsewhere than on the campus—an increasingly large and important group.

The reverse side contains a series of questions arranged in related brackets that can, generally, be answered by a check-mark opposite one item per paragraph. This side of the form replaces the crowded lower half of the former sheet that often tended to be illegible to the chairman and exasperating to the physician. It concerns procedure, and the recommended technic in each category is plainly underlined. Methods still in use in some places but of questionable reliability are marked by an asterisk. This allows the Committee to reiterate in striking form its recommendations. No college official who makes out a set of returns can fail to know what we, at least, hold to be the safest and best ways of conducting a student tuberculosis program. At the same time, the wording of the questions, the in-

clusion of alternative choices, make it plain that we realize sympathetically that individual colleges must select programs matching their needs and fitting their budgets. Nevertheless, the ideal is there before their eyes, to be achieved when possible. The sending of duplicate questionnaires, one copy to be retained in the college files, further aids the busy health officers and has been commented upon favorably by them.

Finally, a space is provided for questions and suggestions. Many of both are received. A very heavy correspondence has resulted, and it has been the attempt of N. T. A. officials and the Committee chairman to respond as promptly and helpfully as possible. Very often the queries or requests are forwarded to nearby tuberculosis associations, resulting in a personal contact and the supplying of aid right on the spot. Highly technical questions are referred to experts, who have been most kind in answering them to the best of their ability.

Part of the vastly increased response to the 1939-40 questionnaire is due without doubt to our trying a different season for dispatching it. Heretofore it has gone out early in the fall term. This year we sent it from New York early in May, hoping some schools would complete it at once. By October 1, the usual time for beginning our campaign, we had been favored with 226 replies. A follow-up letter sent then resulted in another 249 answers before the December 1 deadline arrived. The success of this new plan means it will be adopted as the future method of preparing the report. Not only does it seem acceptable to the student health personnel, but it is to the advantage of the statistical staff if they can begin study of the figures during the slacker summer months.

It will be remarked that this year we sent questionnaires to 20 colleges and universities in Canada. At present there is no Canadian Student Health Association, and, due to their wide geographical separation, it seems improbable the schools north of the border will soon possess such an organization. So friendly are the relations between the Dominion and the United States, and so frequent have been the requests for information concerning our program emanating from Canada, that we decided to circularize those colleges, hoping they would not misunderstand our motives. Several fine programs are already under way there, and we hoped to be of mutual aid through this extension of factual coverage to include our good neighbors. Certainly we are delighted to observe the manner in which leading institutions on either side of the international line are responding to the anti-tuberculosis challenge. A policy of "share-the-information" should be attractive to all concerned.

Without the freely granted and continuing assistance of the National Tuberculosis Association this Committee could carry on but a fragment of its existing program. We are indebted to that organization for our financial sinews, since they pay for the preparation of our literature, its postage from and back to New York, and the laborious preliminary digesting of the annual returns.

TABLE II.
Questionnaire Survey of Tuberculosis Case Finding in
American Colleges and Universities, 1939-40

	Blanks Sent	Replies Received	TB Programs Reported
Canada	20	7	5
Total	20	7	5
Maine	7	3	2
New Hampshire	7	3	1
Vermont	6	2	1
Massachusetts	41	21	15
Rhode Island	4	3	3
Connecticut	12	7	4
Total	77	39	26
New York	54	32	20
Pennsylvania	67	32	22
New Jersey	19	11	11
Delaware	1	0	0
Maryland	17	8	2
District of Columbia	10	3	2
Total	168	86	57
Virginia	20	11	8
North Carolina	22	16	6
South Carolina	15	5	3
Georgia	15	6	2
Florida	7	0	0
Total	79	38	19
Oklahoma	16	10	5
Arkansas	11	9	2
Tennessee	26	9	0
Mississippi	10	9	4
Alabama	13	5	0
Louisiana	12	4	0
Texas	33	11	3
Total	121	57	14
North Dakota	9	6	6
South Dakota	8	6	3
Minnesota	21	13	12
Wisconsin	24	16	11
Michigan	24	15	8
Ohio	48	35	14
West Virginia	14	12	5
Indiana	27	26	13
Illinois	44	19	7
Iowa	25	11	5
Nebraska	16	9	2
Kansas	21	13	8
Missouri	26	19	4
Kentucky	16	6	4
Total	323	206	102
Montana	7	4	3
Idaho	3	2	2
Wyoming	1	1	0
Nevada	1	1	1
Utah	4	2	1
Colorado	9	4	2
Arizona	3	1	1
New Mexico	4	2	1
Total	32	17	11
Washington	14	8	5
Oregon	10	5	2
California	33	11	7
Total	57	24	14
Grand Total	877	475	248
Previous Year	857	282	165
Two Years Ago	852	238	133
Three Years Ago	819	233	104

Thousands of reprints of the reports and of articles relevant to college health have been supplied and distributed. Through the N. T. A. we have been assured the help of local tuberculosis associations. It would be impossible to mention all who have taken active part in furthering our work during the past several years, but we must thank personally Dr. Kendall Emerson, the managing director, Miss Louise Strachan, director of child health education, Miss Jessamine Whitney and Miss Marion Nelson, statisticians, and Mr. Daniel McCarthy, director of public relations. Only the chairman of the Committee can imagine what his task would have been without these friends to advise and assist him. Thanks must go, also, to fellow Committee members, active and advisory, and to every cooperating college

health worker whose response contributed to this report.

Few schools intimated this year that they were unable to complete the questionnaire due to faulty records. This is an encouraging change. It reveals more have discovered that a relatively simple and inexpensive card filing system suffices to keep track of tuberculin testing, negative and positive reactors, X-ray results, and the like. The Committee's campaign for uniform methods of examination, diagnosis and recording seems to be successful, judged on this basis. But there are enough colleges in which health records are still chaotic to make it imperative that we repeat our appeal that they remedy the situation for their own benefit, if for no other reason. The essential thing is for those conducting health work to know the exact status of their effort and their results at any given moment. With the present and future emphasis on national fitness in a great national emergency confronting us, the cry for efficient, lucid and uniform records is louder than ever. A gratifying but secondary result will be improvement in the scope and accuracy of all such studies as our annual reports.

Table II needs no discussion. It shows the tremendously reinforced response evoked this year by the earlier canvass and much intensified follow-up. In spite of this, there are still six states failing to report a single collegiate tuberculosis program. Here is ample opportunity for activity on the part of the regional tuberculosis executives, for the sectional student health associations, and for the many institutions concerned. Perhaps an appeal to local pride is suggested.

In tables III and IV we have presented the division of the cooperating colleges into classifications according to size and general type. As in previous years the expected ratios are maintained. The most interesting point with regard to these figures remains, conversely, the story told by the absence of many a prominent institution from the ranks. It is not safe to suppose that all the educationally mighty are enrolled among the health-

TABLE III.
Enrollment of Institutions Coöperating in Tuberculosis Survey

Enrollment:	Number of Schools	
	1938-39	1939-40
Less than 500 students	90	175
500 to 999 students	78	129
1,000 to 1,999 students	42	58
2,000 to 2,999 students	20	29
3,000 to 3,999 students	10	17
4,000 to 4,999 students	9	6
5,000 students and over	26	34
Enrollment not given	7	27
Total schools	282	475
Total student enrollment (where reported)	478,574	680,201

TABLE IV.
Tuberculosis Case Finding as Reported in Various Classes of Institutions of Higher Education

Type of School:	Schools with	
	NO TB. Program 1939-40	SOME TB. Program 1939-40
Private Endowed Colleges	158	105
Endowed Universities	14	20
State or Provincial Universities	9	30
State Colleges and Institutes	14	22
State Normal and Teacher's Colleges	28	65
Civic Colleges and Universities	4	6
Total Reporting, 1939-40	227	248

mind colleges and universities. It is unfortunate that space forbids the inclusion of an Honor Roll of schools already embarked on modern case finding ventures. Not only do these alert, progressive institutions deserve public recognition for their awareness of the protection they owe student health, but such a list might satisfy the increasing number of inquiries about the presence or absence of student health safeguards nowadays becoming vocal before matriculation at a given school is decided upon. Health, people are realizing, is not something to be shelved, neglected or taken for granted during four or more college years.

The Committee membership has been polled for individual opinions, and we agree that tuberculin testing is a prime prerequisite to any and all other items in a tuberculosis case finding plan. Only by such means can all the infected students be identified. We further believe in the annual re-testing of all negative reactors, as the transition to a positive Mantoux in a young adult is a phenomenon attended by an unpredictable clinical picture. Where hazards of infection are heightened, as in nursing, medicine, dentistry, practice teaching and so forth, testing at more frequent intervals is indicated.

The employment of the Mantoux intradermal technic is urged by the Committee. The method is harmless, it is not expensive, it is almost fool-proof. There is scant chance of misinterpretation of the test, provided the tactile rather than the visual means of reading a positive be used. And there can be small doubt about tuberculin that actually has been introduced, in measured amount, between the skin layers. We can see no practical advantage in other methods in active young adults. This year's returns confirm our observations of former years that surface-applied tuberculin locates not more positive reactors than we can count on by means of the usual first-strength dose of the Mantoux type.

The Committee consensus holds there is no comparable substitute for the two-dose method of intradermal testing. We receive more queries on this point than upon all others. The reason for the agitation lies in the fact that everyone would prefer a reliable short-cut, a procedure that would halve the bother, the visits and the expense. We can sympathize with all who would like to reduce labor and outlay in this way, but we feel that the clinical indications behind the two-dose method are clear and should receive primary consideration. The very fact that we test with a minute dose followed, where negative, by a stronger one, indicates that clinicians recognize the necessity for protecting the very sensitive against too large an initial dose, too severe a reaction. Also, they do not intend to overlook the less sensitive but truly positive reactor by being content with a dosage that stops short of what is necessary to locate most of the infected. If we view the matter thus, it becomes evident that the alleged bother connected with adequate tuberculin testing is no greater than that inherent in applying any diagnostic procedure in any other suspected disease condition properly and well. And, in an educational institution, the need for adhering to the nearest correct and most generally approved

method is accentuated. Those who feel forced by circumstances to adopt less than the best procedure must accept the inevitably less than complete results.

With regard to the testing product of choice, we feel we should go no further than to suggest, as before, that only reliable tuberculin from well-known sources be employed. The advantages possessed by such highly refined material as the Purified Protein Derivative of Tuberculin have been widely publicized. Many colleges prefer to use it. Some of those not using P.P.D. explain their choice on the basis of cost. Where cost is a factor seriously to be reckoned, the use of any well-standardized Old Tuberculin such as that obtainable from the Saranac Laboratories, Saranac Lake, New York, will prove eminently satisfactory. In fact, our tabulations for the past three years show there is but a fractional percentage of difference averaged in the results reported by colleges using P.P.D. or O.T., always provided that an adequate dosage has been used. As in past reports, the figures favor good dosage, not any specific product. The 1939-40 returns show a ratio of positive reactions of roughly 3 : 2 in favor of adequate dosage, i. e., P.P.D. to 0.005 mg. or O.T. to 1 mg., over less than accepted dosage (such as a single small dose). This latter point is the one to be stressed most strongly, along with the need for avoiding all tuberculins of questionable potency. Nothing but disappointment, waste and confusion can follow use of over-age or unstandardized products.

Table V speaks for itself in depicting the various procedures popular throughout the country. It will be

TABLE V.
Details of Tuberculin Testing in Various Institutions

	1938-39	1939-40
Number of Colleges Reporting Some Tuberculin Testing in Progress	143	213
Method Employed:		
Mantoux Intradermal Technic	136	182*
Von Pirquet Cutaneous Technic	3	6
Vollmer Patch Test Technic	4	11*
Combined Patch and Mantoux	0	4
Not Specified	0	11
Type of Tuberculin Used:		
Purified Protein Derivative	79	90*
Old Tuberculin	55	84
Combined P.P.D. and O.T.	0	2
Patch	4	11*
Combined Patch and Mantoux P.P.D.	0	4
Not Specified	5	23
Number and Strength of Test Doses:		
P.P.D. up to 0.005 mg., or O.T. up to 1.0 mg.	82	103*
P.P.D. not over 0.0002 mg., or O.T. not over 0.1 mg.	39	49
Intermediate-sized Dose	0	14
Combined Patch and 0.005 mg. P.P.D.	0	4
Patch, etc.	7	11*
Not Specified	4	33
Groups Subjected to Test:		
a. Students:		
New Students only	45	28
Annual Re-test for Negative Reactors	59	57
New Students, with Re-test for Seniors	4	27
Any Student, Entirely Voluntary	26	40
First Test Required, Subsequent Tests Voluntary	0	32†
Special Groups only (Nursing, Medical, Dormitory, Teaching Students, etc.)	5	8
Not Specified	4	21
b. Non-Students:		
College Food Handlers (Mostly Required)	71	66
Faculty, Clerks, Other Employees (Mostly Voluntary)	49	54

*One college used Patch test for males, Mantoux for females.

†Some of these schools require re-testing in Junior or Senior year.

TABLE VI.
Details of Chest X-Ray Procedures at Various Institutions

	1938-39	1939-40
I. Schools with Tuberculin Testing	143	213
X-Ray Positive Reactors Once, with Follow-up "When Indicated"	55	56
X-Ray Positive Reactors Annually or oftener	52	68
X-Ray Once; Re-ray Seniors	1	1
X-Ray is Voluntary, Acceptance General	24	45
X-Ray is Voluntary, Acceptance not Satisfactory	8	10
Not Specified	3	20
Fluoroscope:		
a. Used Exclusively, Film only "When Indicated"	5	13
b. Used Supplementary to Films	36	42
II. Tuberculin Testing Waived for Special Groups:		
Routine Chest Films for Faculty	1	1
Routine Chest Films for Food Handlers	2	5
III. Schools without Routine Tuberculin Testing	22	35
Routine Chest Films for Students	22	32
Routine Fluoroscopies for Students	0	3

noted that a few colleges are experimenting on certain debatable phases of the testing technic. Their results will be followed with great interest by us and by other schools. Gratifying is the evidence of general acceptance of the Mantoux test, the adequate dosage with reliable tuberculin, and the decline in programs wherein testing embraces students on one occasion only. There is also slight improvement in faculty coverage offered, unfortunately matched by a small falling off in attention to food-handling employees required. The considerable variation in programs again emphasizes that many colleges are doing their best under handicaps known only to themselves. Far better a program of sorts, intelligently administered, than none at all.

Further improvement is brought out in table VI, where we find more schools insisting upon satisfactory X-ray follow-up of their positive reactors than before. The Committee continues to advocate that invariably the finding of a positive Mantoux should be succeeded by a good chest film, and that, where possible, the fluoroscope, in trained hands, be used as a supplement to filming. We are unable to endorse routine fluoroscopy as a substitute for films. The screen must be of the best and fastest type to locate very early lesions, and the operator must certainly be an expert. Even then, films for permanent record and progress comparison are essential. The combination of film and screen seems ideal, and 42 colleges now use this team.

With regard to photographic reproductions upon minicamera film or upon 4x5 films of fluoroscopic lung images, the Committee members feel safe in stating that the former lose greatly and the latter lose some detail when compared with standard 14x17 X-ray films. However, their value in mass surveys where time and expense are paramount considerations is undoubted. We doubt their requirement in the average college. The point to be remembered is to realize their limitations. For all those institutions that can afford to retain older, standard filming methods, we still advocate no change. The extensive tests to which the newer mass procedures will be subjected by governmental and industrial agencies

TABLE VII.
Tuberculin Testing of American College Students, 1932 to 1940, inclusive

Year	Total No. Tested‡	Pct. Positive	Pct. Men Positive	Pct. Women Positive
1932 - 33	14,318	35.0	35.0	27.0
1933 - 34	25,184	30.3	30.0	26.0
1934 - 35	26,861	29.4	30.0	27.8
1935 - 36	31,601	30.0	31.0	28.0
1936 - 37	56,224	27.3	29.4	24.8
1937 - 38	64,232	25.8	29.8	23.5
1938 - 39	82,774	25.5	27.0	24.3
1939 - 40§	123,389	25.4	26.5	22.0

‡In their returns, some colleges fail to differentiate their reactors by sex, so that the total number tested is annually slightly in excess of the sum of those reported according to sex.
§Reliable returns only.

will be watched by student health physicians with real interest and eventual profit.

In preparing table VII we used the data from only 166 colleges. Their figures seemed of a quality in line with former reports. Since the number of students tested is almost half as great again as those reported one year ago, the continued steady shrinkage in positive reactors that has been proceeding for several years seems quite significant and heartening as indicating a national decline in childhood infection. It must not be overlooked, however, that this poses a new problem in the epidemiology and clinical course of tuberculous infection that is delayed until adolescence or early adulthood. The fact that currently an average of only one young college adult in four is infected with tubercle bacilli is in sharp contrast with the concept necessarily prevalent a generation ago that virtually all grown-ups gave a positive reaction to tuberculin.

Since the figures for negro students are at some variance with those from colleges where the enrollment is almost entirely derived from the white population, a separate report is being prepared by Dr. P. B. Cornely, of Howard University, Executive Director of the National Student Health Association, based on returns from 20 of 110 negro colleges circularized this year. It is fine to see this parallel study to our own meeting with warm response.

Finally, now that we have discussed the why and the how of college tuberculosis control, what of the results crowning the efforts? The figures this year are equally as conclusive and as startling as those that have concluded previous reports.

By way of contrast, let us first examine the returns supplied through the kindness of colleges still without any formal or organized degree of case finding but willing to aid us by answering as much of our questionnaire as they could. There were 227 of these schools reporting for 1939-40, and their enrollment, in round terms, was about 200,000 students. Some had student health coverage up to a point. Many had no regular medical service. But, in some manner, they discovered and kept track of 35 cases of student tuberculosis, 21 diagnosed as active, 14 as clinically arrested. A total of 25 students left college during the year because of tuberculosis. These colleges reported 13 non-student cases diag-

TABLE VIII.
New Cases of Pulmonary Tuberculosis Diagnosed
Among College Students, 1938-40

A. In Institutions with SOME Organized Tuberculosis Program:		
	1938-39	1939-40
No. of Clinically Active**		
Cases Diagnosed	241	292
No. of Apparently Arrested**		
Cases Diagnosed	368	345
Total NEW Cases Reported	609	637‡‡
No. of Students Who Left College		
Because of Tuberculosis	151	273‡‡
No. of Institutions Reporting	165	248
Approximate Total Enrollment	348,713	490,000
B. In Institutions with NO Organized Tuberculosis Program:		
	1938-39	1939-40
No. of Clinically Active**		
Cases Diagnosed	4	21‡‡
No. of Apparently Arrested**		
Cases Diagnosed	15	14
Total NEW Cases Reported	19	35
No. of Students Who Left College		
Because of Tuberculosis	4	25
No. of Institutions Reporting	117	227
Approximate Total Enrollment	129,851	200,000

**Generally recognized criteria of activity were specified.

‡‡Colleges with programs had back in school under close observation 338 further OLD cases, while colleges without programs knew of 23 similar cases among their students.

‡‡‡In addition to these students, there were discovered 39 non-student cases in schools in Group A, 13 in schools in Group B.

nosed, and knew of 23 old, previously discovered student cases of the disease back in school under observation. This adds up to a known tuberculosis census of 71 cases encountered on their campuses during the past school year. What the true number of cases may have been remains guesswork, as does the tuberculosis situation in schools that failed to reply, but some clue is provided by the experience of another group of institutions.

This second aggregation of colleges contained the 248 schools we have related as having some measure of case finding in operation. Some of these schools had rather elaborate programs, years old, others were recently begun and far from embracing all their students. However, among this more or less protected student mass that roughly totalled 490,000, there were diagnosed the following: 292 active cases, 345 that were apparently arrested, and 39 cases among non-students. There were 273 withdrawals from college because of tuberculosis, 150 entering sanatoria. Among the students attending college were 338 additional old cases returned to classes and remaining under strict supervision. This makes a total census of 1,114 individuals with macroscopically demonstrable tuberculosis ferreted out on campuses where search rather than wait was the rule. Using only the active cases as a basis for comparison, it is seen that such cases, dangerous to themselves and to others, were turned up with much greater frequency in the second group. Also, it is fair to presume, from experience, that these cases were found early, often preclinically, instead of late and with markedly consumptive signs and symptoms. If any proof were needed to clinch the argument in favor of early diagnosis by modern methods, these figures, corroborated by similar tabulations from pre-

ceding reports, would seem to be sufficiently impressive and persuasive.

It is encouraging to see that victory over tuberculosis is already promised to those who employ the right weapons. It is gratifying to be able to present a report that tells of growing successes. But the battle is barely started. The colleges can and should be in the forefront of all those public institutions aiming at eradication of tuberculosis from American life. Educators are sensing the urgency that animates an enlightened citizenry intent on eliminating every preventable disease from the calendar of human misery. Public spiritedness is all that is needed, once the preventive idea has been planted. But, if any additional force were required, the keen, incisive spur of academic competition is at work to quicken the dilatory to take whatever action is necessary to bring their colleges into line with the progressive pace-makers.

Your Committee members are encouraged by the progress to date. We are proud and happy to present this Tenth Annual Report, with its laudable gains. But we warn everyone that this is no time to celebrate, to waver, or to grow careless. There can be no rest for any of us whose medical and social and educational consciences are awake until we can report that for every questionnaire we send out to American colleges, there has come back a reply stating: "We *have* a modern tuberculosis control program, and tuberculosis will not catch this college or any of our students napping!"

Tuberculosis must go!—but not to college!

Respectfully submitted for the

Tuberculosis Committee,

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December 28, 1940.

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APPLICABILITY OF COLLAPSE THERAPY TO TUBERCULOSIS IN STUDENTS*

John Alexander, M.D.
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(Abstract)

The speaker stressed the great importance of instruction of students in colleges and universities in regard to the prevention of tuberculosis by good health habits . . . instruction about contact infection, and the means of detection and treatment of tuberculosis. Sound knowledge on the part of students should have an important influence in spreading this knowledge throughout the country. College students and graduates should be thoroughly informed about this disease as a fundamental part of their education.

With regard to the management of active cases of tuberculosis in those who are applying for admission to colleges and universities, the speaker believes that such applicants should be temporarily refused admission and that the college medical authorities should render a full report of the condition found, together with full recommendations as to treatment, to the patients' family physicians.

Those students who develop active tuberculosis after enrollment should be handled in exactly the same way as other persons with active tuberculosis, without regard to the disappointments and sacrifices involved, and without subjection to irrelevant pleas by doting, ambitious parents.

*Abstract of address delivered at luncheon, twenty-first annual meeting of American Student Health Association, Ann Arbor, Michigan, December 28, 1940.

With rare and unimportant exceptions, active tuberculosis in a youth, no matter how tiny the lesion, should be treated under sanatorium supervision and the patient not allowed to do part-time work and "take things easy." Such a compromise with adequate treatment too often results in tragedy through an unnecessarily prolonged illness or the loss of life. Only in a very good sanatorium can a student or other youth receive the hourly supervision of his physical activities, minute instruction about matters of health and indicated changes in the course of treatment at exactly the right time.

Various forms of collapse therapy have frequent uses in students with active tuberculosis, as with other young persons. For a minimal lesion, temporary paralysis of the phrenic nerve together with bed rest is often sufficient to bring about complete healing but the temporary paralysis of the nerve may need to be repeated two or three times at six-month intervals. When the lesion is sufficiently severe to require pneumothorax, this form of collapse therapy should be promptly given and maintained for the necessary period of years so that the reactivation of the tuberculosis activity that might occur if the pneumothorax were abandoned too soon will not occur. Complicated cases of tuberculosis in which tuberculous involvement of the trachea or bronchi is suspected should, of course, be expertly examined bronchoscopically. Advanced cases of cavernous tuberculosis that fail to respond to simpler measures demand thoracoplasty or some other major surgical operation that is suitable for the particular case.

In the treatment of tuberculosis, delay in doing exactly the right thing at the right time is the greatest cause of disappointment, failure and tragedy.

Thoracic Surgery in the Insular Tuberculosis Service of Puerto Rico

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Rio Piebras, Puerto Rico

THE importance and response of patients to active collapse measures in the treatment of pulmonary tuberculosis needs no elaboration. That these measures in themselves will materially decrease the mortality in a large, overcrowded, poor population, particularly as found in Puerto Rico, needs further study. Certainly, the improvement in the socio-economic status of the individual, the establishment of an efficient case finding facility, and the availability of means of segregating the infected individual are of the greatest importance, and the surgical treatment of pulmonary tuberculosis is but a part of the whole public health program in the fight against this disease.

That it is an important part of the program, however, we feel safe in asserting, and since 1936, we have been rapidly increasing the scope and size of the surgical department in the antituberculosis service of Puerto Rico. There are now in existence four tuberculosis hospitals comprising approximately 1500 beds and nineteen antituberculosis centers distributed throughout the island. Both hospitals and centers are staffed by full time medical officers, there is a social service set up in each institution, and a visiting nurses organization it attached to each antituberculosis center. The antituberculosis centers are concerned primarily with case finding, diagnosis, and ambulatory treatment, particularly by pneumothorax. All cases for thoracic surgery are routed from the centers into the tuberculosis hospitals, particularly the one at Rio Piedras which is an 800 bed institution completely equipped to carry out any major surgical procedure. This organization of hospitals and antituberculosis centers thus provides a means not only of instituting therapy in a large number of ambulatory patients, but provides a ready means whereby a large number of patients who have had some form of surgical collapse therapy performed, particularly pneumonolysis, may be continued as ambulatory cases early.

The epidemiological and clinical studies of J. Rodriguez Pastor,¹ and the pathology studies of E. Koppisch² have demonstrated that the Puerto Ricans are a highly tuberculized people with considerable immunity against this disease, and their response to active collapse measures is comparable to that seen in similarly constituted groups. The environmental, and socio-economic status of these patients must be noted, however, and a true evaluation of results both early and late must be viewed through this light.

Some idea of the type of patient which makes up a large part of the tuberculosis hospital population may be obtained from a study carried on in several antituberculosis centers of 757 tuberculous families. Eighty-two per cent of this total had weekly incomes of three

dollars or less. In 46 families the income was from five to ten dollars a week, but in this group there was an average of seven persons per family, which demonstrated that even the highest income group did not live on a subsistence level. A study of the housing conditions of 855 patients revealed that 67 per cent lived in one or two room dwellings, which were badly ventilated in over 40 per cent. The diet of the great majority was deficient in protein, which was not only due to the economic conditions, but to a lack of knowledge of what constitutes a balanced diet. Intestinal infestation with *uncinariasis* was present in 22 per cent of the patients admitted to the hospital, and this together with the prevalent malarial infection was responsible for a high incidence of secondary anemia. Fortunately this type of anemia responded to intensive iron therapy.

Because of the large amount of tuberculosis present in Puerto Rico and the comparative shortage of hospital beds, artificial pneumothorax has been used intensively, not only as a major therapeutic measure, but in an attempt to convert as large a number of patients as possible to an ambulatory condition and maintain them in that status. Early closed intrapleural pneumonolysis has therefore been employed to an ever increasing extent for the conversion of a large proportion of unsatisfactory pneumothoraces, because of intrapleural adhesions, into effective ones.

We have felt increasingly that there is no set time limit during which pneumothorax need be maintained in order to prove its ineffectiveness, and that it is futile to maintain an unsatisfactory pneumothorax and attempt to stretch adhesions by increasing and maintaining high intrapleural pressures. We have considered few contraindications to the division of adhesions, perhaps the most important being that pneumonolysis should not be done during the acute stage of fluid formation nor during an acute empyema. We have entirely discontinued the use of stereoscopic films, oblique views, and films taken in an exaggerated lordotic position, and have come to the conclusion that the final decision of whether adhesions can be severed or not can be made only on direct thoracoscopy. Furthermore, as Coryllos³ has pointed out, the extent to which resection may be carried out in a case, particularly one with extensive adhesions, depends much upon whether the case is one of unilateral or bilateral disease. Much more radical and extensive resections are justifiable in cases with bilateral disease where a satisfactory collapse of one side must be obtained before some form of collapse may be applied later to the other side. Multiple stage operations are frequently resorted to, and we have been gratified on many occasions at

achieving success in some cases where at first the situation appeared hopeless.

Some appreciation of the results obtained by closed intrapleural pneumonolysis can be obtained from an analysis of 200 consecutive cases.⁴ This analysis was concerned not only with the number of satisfactory pneumothoraces ultimately established, but primarily with seeing many of these cases were converted to a negative sputum status.

This group of cases included 104 males and 96 females ranging in age from 11 to 50 years. In 50.5 per cent the adhesions were completely cut, in 34 per cent the adhesions were partially cut, and in 15.5 per cent no adhesions were cut.

In cases with unilateral disease where the adhesions were completely severed, 80.4 per cent not only had a satisfactory pneumothorax, but were converted into a negative sputum status. In cases where the adhesions were only partially cut, or where several but not all of the adhesions could be cut, 68 per cent were converted to negative. In cases with bilateral disease in which there was some form of contralateral collapse therapy also present either by pneumothorax, pneumothorax plus pneumonolysis, or thoracoplasty, 47.7 per cent were converted to a negative sputum status. There were nine cases in which bilateral closed intrapleural pneumonolysis was done, and of this number four or 44.4 per cent were made negative.

In 80 per cent of the successful cases the conversion of sputum from positive to negative took place within the first four months; to which we apply considerable significance, because if the sputum remains positive after this time we begin to think seriously of other methods of collapse. There was no immediate mortality resulting from the operation. Eighteen and five-tenths per cent developed fluid postoperatively and in 7.5 per cent of cases a pure tuberculous empyema was known to have occurred. A mixed infection empyema resulting from the operative procedure occurred once. There was no other morbidity of any significance.

We are employing the double unit type of apparatus in which the thoracoscope and cautery are separate, and are using the galvano-cautery rather than the diathermic knife.

Thoracoplasty also plays a large part in our surgical service. We prefer to add an extrafascial apicolysis after the manner of Carl Semb⁵ wherever possible, particularly in cases where the cavity is large and medially located. The first three ribs are usually removed almost in their entirety, as well as the transverse spinous processes and intercostal bundles, during the first stage. Although apicolysis is done in the majority of the cases during the first stage, further "decollation" has not been necessary in the majority of the cases during the second stage, and we have reserved doing it only in those cases where there was danger of the cavity being displaced into the paravertebral gutter. The addition of apicolysis has not materially increased the morbidity, and we feel that it has decreased the number of stages and the incidence of thoracoplasty revisions for uncollapsed cavities.

Cyclopropane anesthesia has been used practically in every case, and it has been particularly beneficial in cases with bilateral disease, where some form of collapse therapy on the contralateral side was in existence at the time of thoracoplasty. There has been no mortality or morbidity attributable to the anesthesia.

In a preliminary analysis of 175 consecutive cases of thoracoplasty in which 355 operations were performed, the following data is noteworthy.

In cases with unilateral disease of which there were 133, 96 (or 73 per cent) were converted to a persistently negative sputum status. There were 42 cases with bilateral disease, each of which had some form of contralateral collapse, either by pneumothorax,^{3,1} pneumothorax completed by pneumonolysis,⁵ thoracoplasty,¹ and phrenicectomy.² In this group with bilateral disease and contralateral control, 23, or 52.4 per cent, were converted to a negative sputum status. Taking both groups, together, 119, or 68 per cent, were converted to negative.

There were 20 deaths in this series of cases, of which four were early, that is having occurred within the first two months after operation, and 16 late deaths ranging in time from five months to thirty months after operation. Twelve deaths occurred in the group with unilateral disease (113 cases; 271 operations) giving a final case mortality of 9 per cent and an operative mortality of 4.4 per cent. There were eight deaths in the group with bilateral disease (42 cases; 84 operations) giving a case mortality of 19 per cent and an operative mortality of 9.5 per cent. Both groups considered together (175 cases; 355 operations) gave a final case and operative mortality of 11.4 per cent and 5.6 per cent respectively.

The most frequent cause of death was failure to control the disease after thoracoplasty with gradual progression of the process. This accounted for 13 late deaths. Tuberculous meningitis, repeated severe hemoptysis, shock after extensive revision operation, auto-tuberculinization, spontaneous pneumothorax in a bilateral case, acute spread following operation, and bronchial obstruction and massive atelectasis accounted for one death each.

Phrenic nerve interruption is employed to a minor extent on our surgical service. There is still considerable discrepancy in the results reported in the literature, and our own figures are not convincing. We have used it only in cases with cavitation, rather than in benign exudative or productive lesions, and it is noteworthy that our best results have been obtained in cases with basal cavities. We never employ phrenicectomy or phrenic crush as a preliminary to thoracoplasty, because we feel that after thoracoplasty the diaphragm becomes a major respiratory muscle important to the preservation of the proper ventilation of the uncollapsed lower parts of the lung. For this same reason, we hesitate to do a phrenicectomy wherever we feel that the lesion is so situated and of such extent that thoracoplasty is the procedure of choice to begin with. Crushing of the nerve rather than evulsion is preferred, so that if the procedure is

not effective, the movement of the diaphragm is not irreparably done away with.

We are less enthusiastic about extrapleural pneumothorax than we were a few years ago.⁶ The efficacy of the operation is dependent upon the creation of a large extrapleural space which is frequently difficult to do and more dangerous than thoracoplasty. The maintenance of the pneumothorax space is not easy, and we have had a sufficient number of late complications such as empyema and bronchial fistulae to feel that this operation does not supplant thoracoplasty, and has its main indication in a limited group of well selected cases. We are now employing it mainly in cases with bilateral disease, where bilateral selective collapse therapy is desirable and where an irrevocable operation like thoracoplasty might be too formidable or contraindicated, and in children where pneumothorax is impossible, phrenicectomy ineffectual or inadvisable and where thoracoplasty might produce a deforming scoliosis.

In a small group of cases where an ineffectual intrapleural pneumothorax was in existence, we have combined an extra and intrapleural pneumothorax, making a large opening at the time of operation to connect the extra and intrapleural spaces. Our series of combined pneumothoraces is as yet too small for definite conclusions, but it has interesting and perhaps valuable possibilities.

One point in the technic of extrapleural pneumothorax may be noteworthy to mention. In order to insure an air-tight closure, we utilize a muscle flap, composed of the posterior superior serratus muscle which is severed at its upper tendinous attachment, carefully stripped off

from the underlying fascia and first three ribs and with its fleshy digitations to the fourth and fifth ribs preserved. There is much less retraction of this muscle when severed at the top at its tendinous portion rather than at its fleshy digitations. It can then be readily swung around to cover the defect in the paravertebral portion of the fourth rib which is the one usually resected, and aids materially in obtaining an air-tight closure.

We have completely given up such operations as apicotomy with plombage, and scalenotomy as being of comparatively little value.

CONCLUSION

Thoracic surgery plays an important part in the anti-tuberculosis program of the Insular Health Department and efforts are constantly being made to widen and improve its scope.

Closed intrapleural pneumonolysis, thoracoplasty and to a lesser extent phrenicectomy, and extrapleural pneumothorax make up our main surgical armamentarium.

The extent, type, and progression of the disease as found in Puerto Ricans is comparable to that seen in other tuberculized people with considerable resistance to the disease and the response of the Puerto Ricans to active collapse measures is comparably good.

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A MESSAGE TO ALL EMPLOYERS OF REGISTERED NURSES

Through the Red Cross Nursing Service, thousands of the Nation's finest young nurses are being recruited to serve with the rapidly expanding medical departments of the Army and Navy.

In many instances, this recruitment program will inevitably leave gaps in the facilities of civilian hospitals and health services that can be perhaps only partially filled. Yet, during these days of emergency, preparations for total defense require that every institution and organization be willing and prepared to make extensive sacrifices.

Nurses in encouraging numbers are making their sacrifices by giving up a year of their civilian career for a tour of patriotic duty. In order to further encourage and stimulate the recruitment of nurses for the military services, I would urge hospitals and other organizations employing nurses to:

First: Encourage their nurses to offer their services to the country and arrange, wherever possible, for holding their positions until they return to civilian life from their year of service.

Second: Institute, or, in conjunction with other organizations support, "refresher" courses for nurses who are now inactive but otherwise competent and experienced for nursing staffs. Such women are being discovered by the Nation-wide inventory of nurses.

Third: Many of these inactive nurses already have signified their willingness to return to duty during the emergency. I would urge the temporary employment of this type of nurse to substitute for members of your staff called to military duty. By this method, no serious disruption should occur in the operations of your agency or institution.

IRVIN ABELL, M.D.,

Chairman, Health and Medical Committee of the Federal Security Agency.

Acute Respiratory Infections Including Lobar Pneumonia and Atypical Pneumonia in a Young Adult Group*

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THE frequency and apparent benignity of acute infections of the respiratory tract, which more commonly than not run their course without medical observation, have tended to prevent clinical study commensurate with the importance of these diseases. As Diehl¹ points out, the "common cold" is the commonest of all human ills, and Brundage² states that approximately 50 per cent of time lost from work on account of illness in industrial workers is due to respiratory infections. In the present study, from 20 to 43 per cent of all hospitalizations were cases of respiratory illnesses.

The importance of the treatment of complications such as mastoiditis, peritonsillar abscess, and suppurative sinusitis has often monopolized attention at the expense of study of the initial common cold, tonsillitis, or other upper respiratory infection. The fact that certain diseases such as acute rheumatic fever are not infrequently preceded by infections of the upper respiratory tract also emphasizes the importance of the latter. Furthermore, the development of chemotherapy with its selective application has stressed the necessity of consideration of the etiology of these infections. For these reasons, the experience in a hospital service, of acute respiratory infections in a large group of young adults over a period of years, has been deemed worthy of report.

Material Utilized in the Study. The cases studied were all University of Minnesota students who had respiratory infections severe enough to warrant hospitalization in the students' infirmary on the main or agricultural campus. Study has been made of all such hospitalized cases of acute upper respiratory infections from the school year 1934-35 through the school year 1939-40, and of all hospitalized cases of pneumonia from the school year 1930-31 through the school year 1939-40, a total of over 3,100 admissions.

It should be emphasized that in this group of young adults alcoholism and chronic debilitating illness were not contributing factors as is encountered not infrequently in a general hospital service. Cases with respiratory symptoms of measles and scarlet fever were not included. The ages of the great majority of the group fell between 18 and 24 years, and males predominated about 2:1, which is roughly the ratio of males to females in the school population.

Classification of Acute Respiratory Tract Infections. The term *upper respiratory tract* has been used to include those structures proximal to the pulmonary alveoli.

*From the Students' Health Service, University of Minnesota.

TABLE I.
Incidence of Hospitalized Respiratory Infections

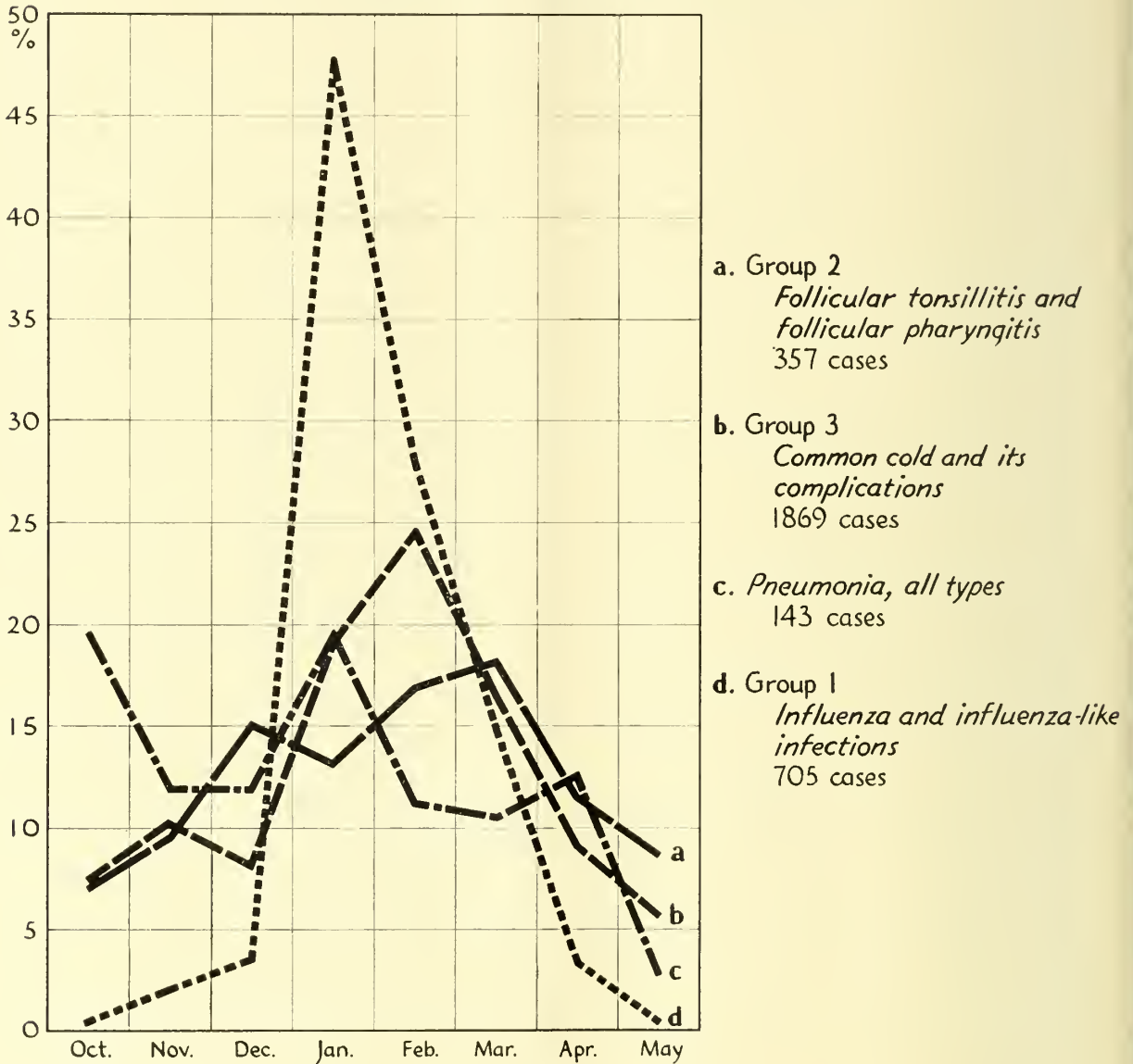
	School Year					
	1934-35	1935-36	1936-37	1937-38	1938-39	1939-40
GROUP 1: Influenza and influenza-like infections	132	44	160	93	237	41
GROUP 2: Follicular tonsillitis and follicular pharyngitis	45	102	55	79	31	56
GROUP 3: Coryza, pharyngitis, laryngitis, tracheobronchitis	245	298	269	246	410	426
Pneumonia: Frank lobar Bronchopneumonia	18 8 10	33 16 17	17 7 10	27 17 10	51 11 40	7 2 5
Total cases hospitalized respiratory infections	440	477	501	445	729	530
Per cent of total hospitalizations represented by respiratory infection	20.3	31.4	33.0	34.1	43.3	36.2

While recognizing the limitations of any classification not based wholly on etiology, the infections of the upper respiratory tract studied have seemed naturally to fall into three main groups: First, influenza and influenza-like infections; second, follicular tonsillitis and follicular pharyngitis; and third, the common cold and its complications (coryza, simple pharyngitis, laryngitis, tracheobronchitis). The relationship of infections of the upper respiratory tract to *pneumonia* has led to a consideration of its incidence and characteristics, providing a fourth group for study.

Table I shows the total incidence of those respiratory infections which were admitted to the University of Minnesota Students' Health Service hospitals from September 15, 1934, to June 15, 1940. Shown in the table also is the relative importance of acute respiratory infections, as indicated by the percentage of total hospitalized cases which they represent. These latter figures vary mainly with the presence or absence of epidemics of other diseases. Thus in 1934-35 there were epidemics of both German measles and scarlet fever.

The seasonal variation in incidence of the four groups of respiratory infections is presented in figure 1. The increased incidence of the common cold and its complications during the winter months, the sharp peak of influenza in January, the relatively more constant occurrence of the follicular group, and the erratic nature of the pneumonias are shown.

SEASONAL VARIATION OF RESPIRATORY DISEASE 6 year period, October through May



- a. Group 2
Follicular tonsillitis and follicular pharyngitis
357 cases
- b. Group 3
Common cold and its complications
1869 cases
- c. *Pneumonia, all types*
143 cases
- d. Group 1
Influenza and influenza-like infections
705 cases

Fig. 1.

Group 1.—INFLUENZA AND INFLUENZA-LIKE INFECTIONS

Increases in the incidence of cases diagnosed influenza or influenza-like infection appeared in this group on alternate years (table I and fig. 2). The common difficulty of recognition of sporadic cases of influenza is recognized. Emphasis in such cases has been placed diagnostically upon epidemic tendency and the extent of the systemic reaction which is out of proportion to the minimal local findings in the nasal or pharyngeal mucosa, as contrasted with the marked catarrhal symptoms of the common cold. In influenza a dry type of pharyngitis had been frequently described. The preva-

lent conception of the occurrence of normal or reduced leucocyte counts in influenza may have been a factor in diagnosis in the present series, tending sometimes to incorrect conclusions. Leucocyte counts were not diagnostic in the British epidemic of 1936-37 reported by Stuart-Harris and co-workers,³ who found normal or slightly elevated counts, infrequently leucopenia. In our series (fig. 3) the leucocyte count in influenza tended to be higher in 1937-38 than in the other years.

Until more specific means are widely available for accurate diagnosis, there will be unavoidable error in diagnosis of influenza, especially in sporadic form. In

INCIDENCE OF HOSPITALIZED RESPIRATORY INFECTIONS 6 year period

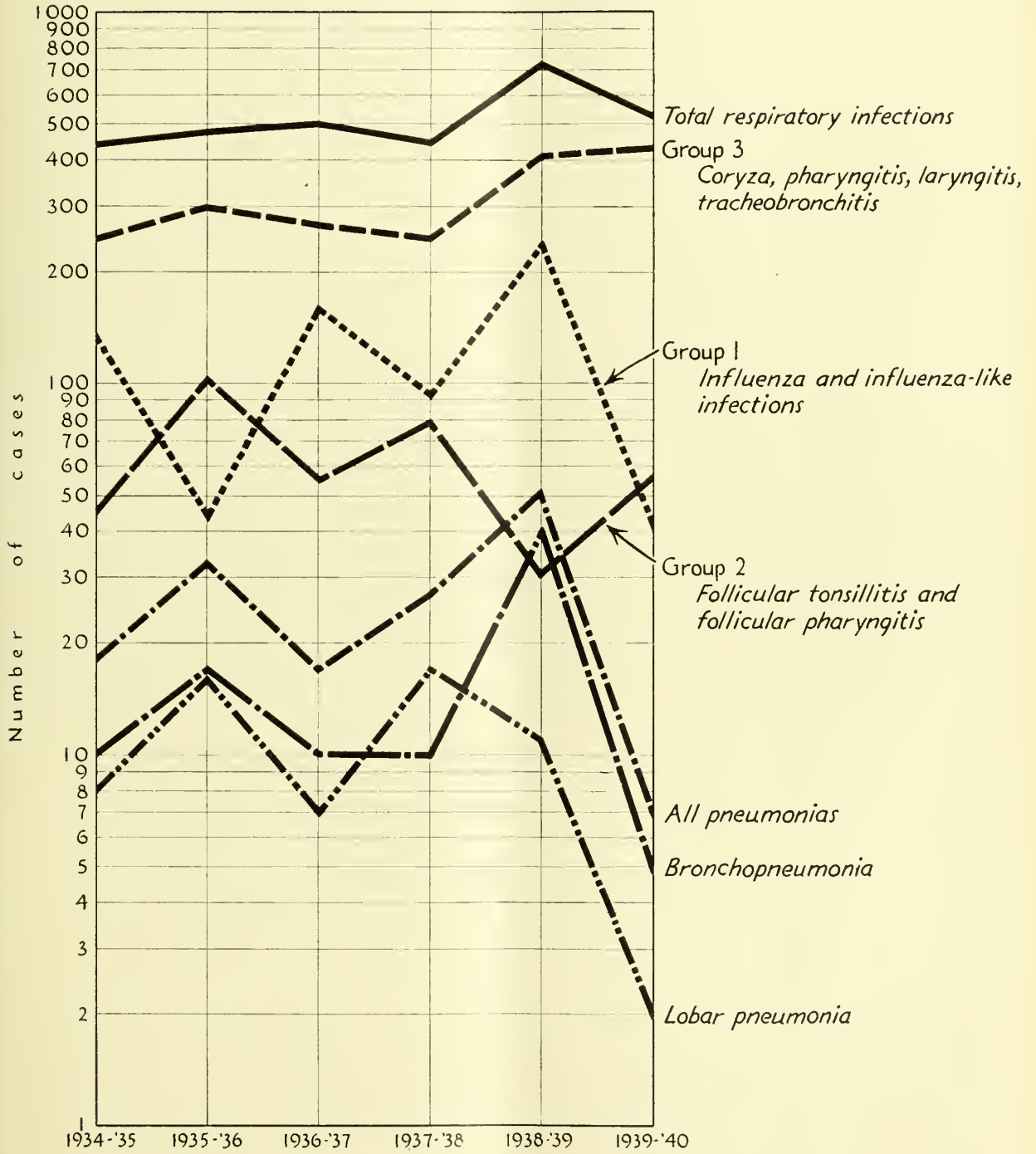


Fig. 2.

the present series, 15 cases of clinically diagnosed influenza were studied by Dr. Clara Nigg,⁴ of the State Board of Health laboratory, who established specific virus etiology in 14 of the 15 cases. These occurred

during the mild epidemic of 1938-39. On the other hand, a subsequent study of a second group of sporadic cases of clinically diagnosed influenza failed to establish specific virus etiology in a single one.

PERCENTAGE DISTRIBUTION OF LEUKOCYTE COUNTS IN INFLUENZA AND INFLUENZA-LIKE INFECTIONS during each of 6 years

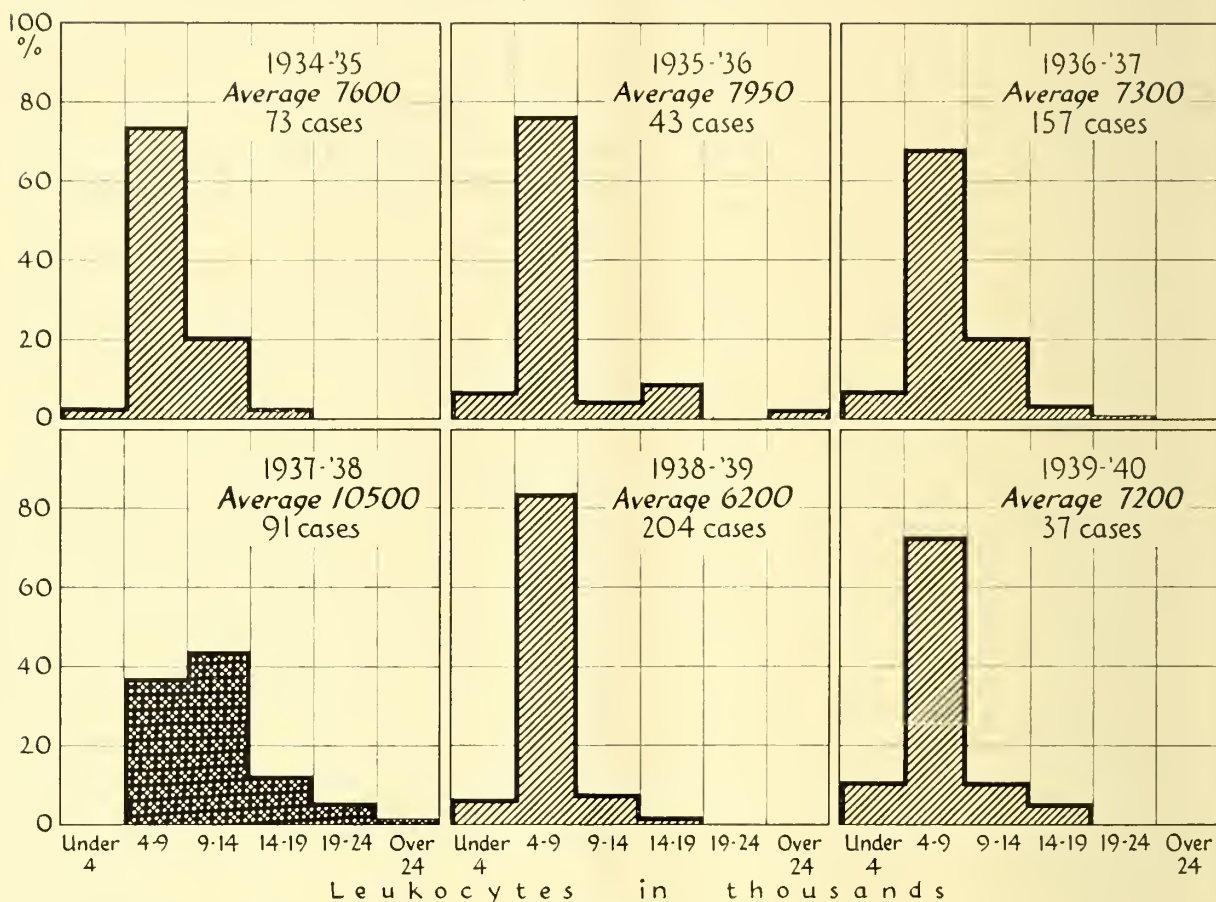


Fig. 3.

Group 2.—FOLLICULAR TONSILLITIS AND FOLLICULAR PHARYNGITIS

These cases have presented features sufficiently characteristic to warrant their classification separately, although Stuart-Harris has chosen to include them together with the coryza group (our Group 3) under the general heading of "febrile catarrhs". The etiologic agent of this group is usually the beta hemolytic streptococcus, although occasionally the streptococcus viridans has been reported from throat cultures. Most of the cases presented a distinct, well recognized clinical entity with sore throat, intense systemic reaction, patches of follicular exudate over the tonsils or pharyngeal lymphoid tissue, leucocytosis, and a tendency to prompt recovery. Also included are those cases with marked injection of the faucal structures approaching the intensity of redness noted in scarlet fever with or without areas of exudate. The complication of peritonsillar abscess occurred infrequently. These cases had the usual symptomatic and bedrest treatment. The prompt fall of

temperature within four days and the absence of frequent or fatal complications of tonsillitis on the service in a 20 year period speaks against the routine use of sulfanilamide in the treatment of tonsillitis except in cases selected on account of complications or unusual severity.

An "average" temperature curve of acute follicular tonsillitis is presented in figure 4. This has been constructed from 50 cases of the disease chosen at random from the list of hospital records. The curves were corrected to a common day of onset, and the normal diurnal temperature is incorporated into the chart for comparison.

The interesting observation that there are fewer cases of follicular pharyngitis and tonsillitis when there is more influenza is brought out in figure 2.

Group 3.—THE COMMON COLD AND ITS COMPLICATIONS

The group of cases of catarrhal inflammation of the respiratory tract with systemic reaction were considered

COURSE OF TEMPERATURE IN FOLLICULAR TONSILLITIS

Mean variation of temperature in 50 hospitalized cases

Correlated from onset of symptoms

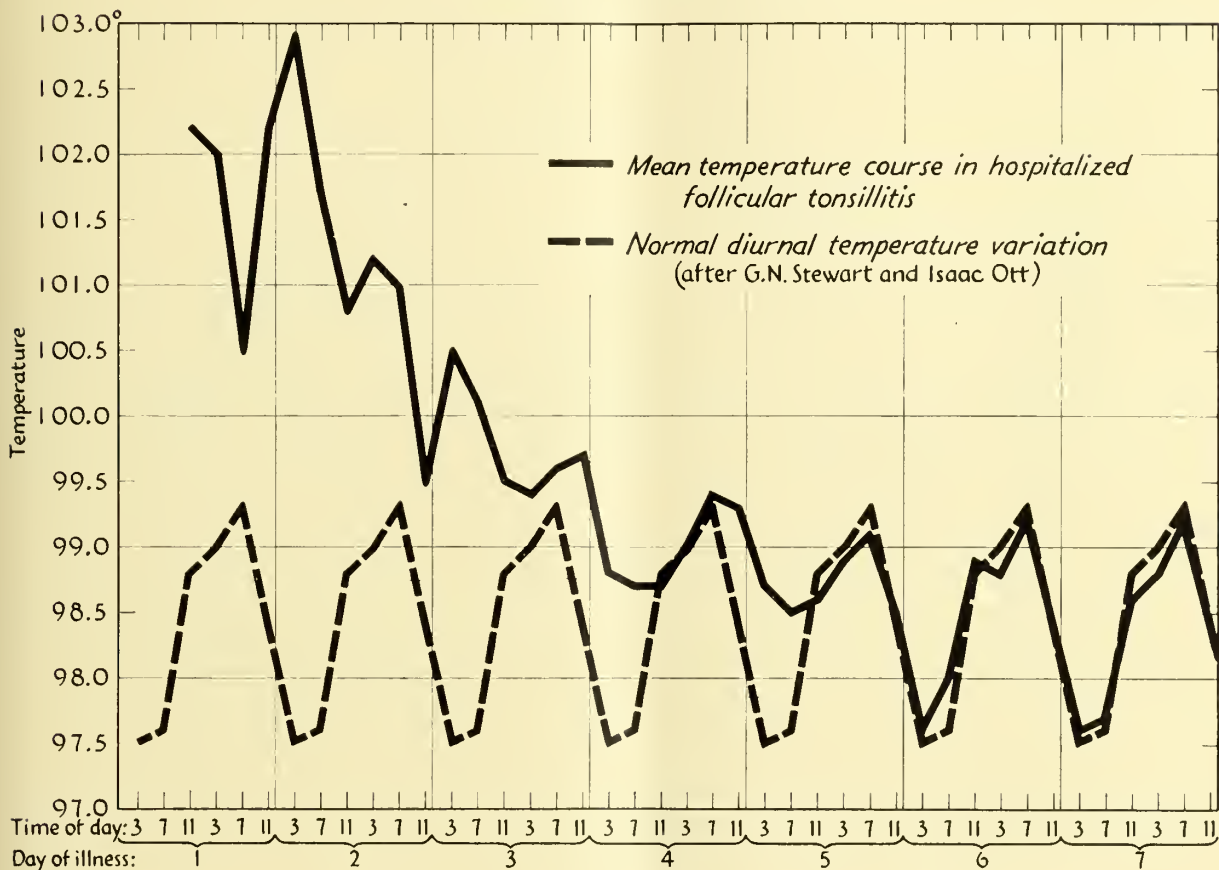


Fig. 4.

to represent complications of the common cold due to the secondary invasion by pathogenic inhabitants such as pneumococci, streptococci, staphylococci, B influenza, and micrococcus catarrhalis. A variety of manifestations is therefore represented, including symptoms predominatingly of naso-pharyngitis, laryngitis, tracheobronchitis, or a combination of all. In the majority of cases the onset was that of a common cold. In this group of cases, during the course of the disease areas of exudate may occur, as well as varying degrees of injection of the faucal structures. The cases were selected for hospitalization on account of febrile and systemic reaction.

The Leucocyte Count in Acute Upper Respiratory Infections. White blood counts were made routinely at the time of admission and were available for most of the patients studied. Although subsequent counts were made on many, only the admission values were used for statistical analysis. The percentage distribution of these counts in the various groups is shown in figure 5.

The highest average counts were in the cases of follicular tonsillitis and pharyngitis. These varied from

9,000 to 13,000, although a few ran below 8,000, and an occasional one reached 20,000 or over. The average for this group (rounded to the nearest 50 cells) was 12,350 in 352 cases, while 1,715 cases of the common cold with its complications averaged 9,500.

The lowest average white count was found in the influenza and influenza-like infections, where 605 cases had an average count of 7,500. During the school year 1937-38, however, there was a relatively higher leucocyte count in the influenza group (fig. 3). Critical analysis of the data showed that a true statistical difference existed between the white counts for influenza this year as compared with other years of the study. The counts were higher for the other groups, also, during 1937-38, but not to as marked a degree as in the case of influenza.

LOBAR PNEUMONIA

In a study of the available hospital records for the school years 1930-31 to 1939-40, inclusive, 63 males and 16 females presented sufficient criteria (abrupt onset, chill, cough, chest pain, rusty sputum, localized signs of pulmonary consolidation, and crisis) to be classified as

PERCENTAGE DISTRIBUTION OF LEUKOCYTE COUNTS IN HOSPITALIZED UPPER RESPIRATORY INFECTIONS 6 year period

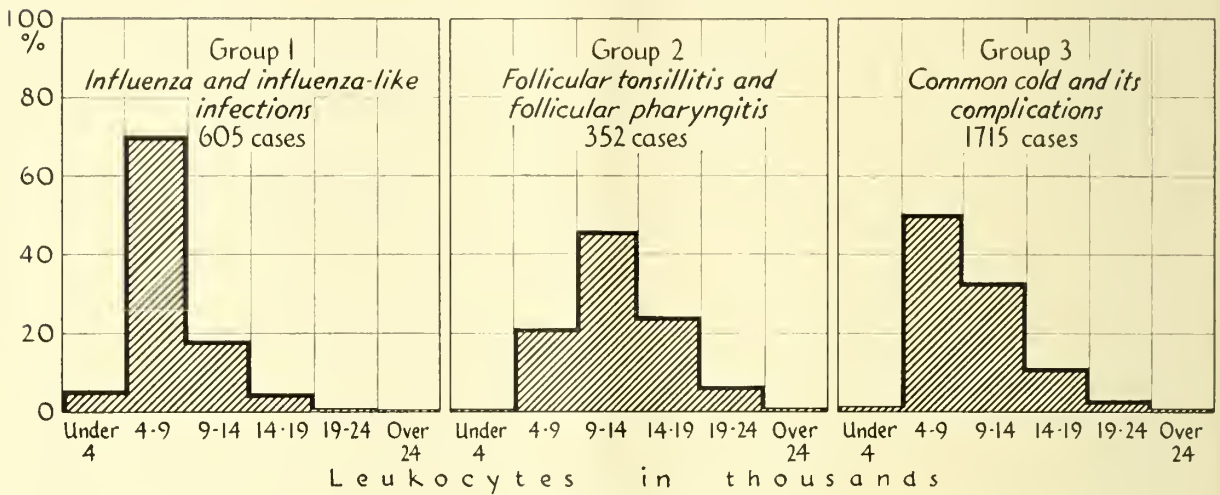


Fig. 5.

TABLE II.
Lobar Pneumonia: Etiology in 30 Cases

Pneumococcus, Type	1	2	3	4	7	8	9	16	22	23
Number of Cases	6	5	5	5	3	1	2	1	1	1

TABLE III.
Lobar Pneumonia: Roentgen Film Diagnosis in 79 Cases

Lobes Involved	Left		Right			Combined
	Upper	Lower	Upper	Middle	Lower	
	3	33	8	5	22	8

cases of lobar pneumonia. Pneumococci were demonstrated in the sputum in 30 of 39 of these cases whose records were complete in this regard (77 per cent). Blood cultures were positive in only 5 of 44 cases in which they were taken (11 per cent).

The incidence of the various types of pneumococci found in the sputum is shown in table 2. Two of the five bacteremias were type 1, and there was one positive blood culture each of type 2, type 7, and group 4 pneumococci.

The location of the lesion in each of the 79 cases of lobar pneumonia, as revealed by roentgen film and physical examination, is shown in table 3. The lower lobes, particularly the left, were more commonly involved, and multiple lobe involvement was uncommon (8 cases). The lesions described by the X-ray department were consistent with the clinical impression in all but 6 cases, 4 of which were given the roentgen diagnosis of "bronchopneumonia", and 2 "atypical".

In general, the X-ray has furnished the most accurate method of determining early lesions, and the extent of their progression. Occasionally small areas of pneumonia are revealed only by roentgen films, although we have rarely encountered cases with marked shadows in which physical signs were entirely absent. Such physical signs as suppression of breath sounds, crepitant rales, or slight impairment of resonance have usually been pres-

TABLE IV.
Atypical Pneumonia: Roentgen Film Diagnosis in 40 Cases

Lobes Involved	Left		Right			Combined
	Upper	Lower	Upper	Middle	Lower	
	2	15	6	2	20	5

ent at the first examination of the patient. Occasionally an area of involvement posterior to the heart with definite physical signs may escape detection by X-ray unless a very careful interpretation is made of anterior-posterior films. In general it may be said that the occurrence of persistent, localized rales, usually at one lung base, has quite commonly indicated the presence of pneumonia as corroborated by roentgen studies.

There was only one death in these 79 cases of lobar pneumonia. This patient was a 28-year-old male who had a type 3 infection and in whom a leukopenia developed. Fifteen cases received type-specific anti-pneumococcal serum, with good results (prompt fall in temperature) in all but one. Four of these specifically treated cases, including one type 2, had positive blood cultures. In addition, 18 cases received serum which was not proved to be type-specific. The fatal case was one of these; he received types 1 and 2 mixed serum because typing was not accomplished until just before his death. Six cases of lobar pneumonia were given chemotherapy during the latter part of the 10-year period. It should

be stated that there was a distinct tendency to the crisis type of defervescence in all recovered cases of lobar pneumonia regardless of the type of treatment. Complications consisted of 4 cases of empyema and 3 of delayed resolution. In considering the type of treatment used, it should be remembered that these 79 cases of lobar pneumonia were encountered over a ten-year period during which there were three definite phases in regard to therapy: first, a period before specific serum treatment was widely used; second, a period of specific serum therapy; and third, a period of chemotherapy either alone or combined with serum treatment.

The leucocyte count in 39 of the 79 cases of lobar pneumonia was below 14,000, and in 15 cases, 8,000 or lower. The rest of the cases had counts between 15,000 and 49,000. All patients with empyema showed increased leukocytosis with the development of the complication. Twenty-seven of 30 cases in which pneumococci were found in the sputum had white counts of 15,000 or more. While leukocytosis seemed to be part of a favorable course, normal or only slightly elevated counts in some instances seemed to indicate a relatively mild process and did not imply an unfavorable course.

Only one of eleven cases diagnosed as lobar pneumonia in 1938-39 had pneumococci in the sputum (type 3) although typing was attempted in all of seven cases who had sputum. As previously noted, influenza virus was demonstrated in cases of clinical influenza at this time. The paucity of pneumococci suggests that a process of unusual origin was under observation during this period. It should be pointed out that there was at this time a marked increase in the number of cases of atypical pneumonia, as discussed below.

BRONCHOPNEUMONIA

From 1934-35 to 1939-40 there were 92 cases diagnosed as pneumonia other than lobar, as compared with 61 diagnoses of lobar pneumonia during the same period. It is appreciated that cases diagnosed bronchopneumonia may represent a group of several etiological entities. With more detailed bacteriological studies becoming available, the etiology of these will undoubtedly come to light. The somewhat parallel frequency of lobar and bronchopneumonia (fig. 2) indicates the need for etiological rather than anatomical classification. During this period there was one case of pneumonia due to *B. tularensis*. A second case had an extensive migratory pneumonia with high eosinophilia. Another case, of bronchiolitis and bronchopneumonia with quite distinctive clinical picture, was seen during this period, in which at first *B. influenza* and later hemolytic streptococci were isolated.⁵

ATYPICAL PNEUMONIA (1938-40)

During the past two school years variation in pneumonia has been noted in that typical lobar pneumonia has become less common and pneumococci have been less frequently isolated from the sputum. The disappearance of pneumococci from sputum examined in this period was striking. A common etiological agent was

not demonstrated. For the first of these two years there were 40 cases in 29 males and 11 females diagnosed under the terms pneumonia, bronchopneumonia, or atypical pneumonia, as compared to 11 cases classified as frank lobar pneumonia during the same period. The physical signs were those that are found in bronchopneumonia without evidence of any extensive consolidation. The finding of a localized area of rales, often over one lung base with or without altered resonance, fremitus or breath sounds, was common. The roentgen film first showed the process in some of the cases; in all but two with roentgen findings there were corroborative physical signs. The antecedence of physical over roentgen findings was demonstrated in one instance. The experience reported by some observers (Smiley et al⁶) of large pneumonic consolidation by roentgen film without physical signs was not noted in these cases. The impression of members of the staff has been that adequate and repeated examinations usually reveal signs that check with roentgen shadows. For the most part the clinical picture has been one of relatively mild intensity with fall of temperature by lysis. Biphasic temperatures were not characteristic in this group. While the occurrence of a group of cases with atypical characteristics stimulates speculation as to a common and as yet unrecognized etiological agent, it is to be noted that individual cases with similar clinical characteristics have been seen throughout the ten-year period of observation, and it may be said that the epidemic nature of the 1938-40 cases was the outstanding feature. There has been a tendency to multiple and upper lobe involvement during this time.

The X-ray findings were described as atypical in 9 instances; in others as pneumonia, bronchopneumonia, pneumonic process or density. Pulmonary tuberculosis was mentioned as a possibility in two. The leucocyte count has been variable; 17 have had counts from 5,000 to 8,000, and the others had leucocyte counts which were not above 22,000 except one of 31,400. Streptococci, either hemolytic or viridans, were reported in the sputum in 21 instances, and in three were combined with staphylococci. *Pneumococcus* type 19, types 20 and 25, and type 7 were found combined with streptococci in three instances. The type 7 case received anti-pneumococcus serum. Sulfanilamide was given in eight cases. One death occurred in a case of hemolytic streptococcus pneumonia in which empyema and later extension of pneumonia developed.

Atypical pneumonia has been reported from various parts of the country. Reimann⁷ reported a series of cases of acute respiratory infection in which he considered that an unidentified virus might be responsible; pneumococci were infrequently found and pneumonia occasionally occurred, due to unknown agents. The paucity of pneumococci was in keeping with our experience and may have been widespread. Bowen,⁸ Allen,⁹ Rainey and Burbidge,¹⁰ Smiley and co-workers⁶ described atypical cases for which the term pneumonitis is used. These cases were relatively mild in intensity, had prominent X-ray findings, the absence of significant physical signs

and suggested an association with influenza. McCallum¹¹ remarks that in the World War pandemic of influenza different types of lobar pneumonia developed, according to the prevalent bacteria capable of producing secondary infections. It also seems worth while in this connection to call attention to the statement by Bullowa and Wilcox¹² that the endemic pneumonias are a series of diseases which vary as to their occurrence from year to year and month to month, that they differ in respect to the age of the patients, incidence, mortality, tendency to involve the blood stream and other characteristics.

Longcope¹³ reported 32 cases of bronchopneumonia of unknown etiology observed by him at the Johns Hopkins Hospital. The features which distinguish the infection as a disease entity include onset with high fever, headache, sweating, non-productive cough, minimal physical signs of pulmonary consolidation and infrequency of chill, pain in the chest or rusty sputum, together with normal or slightly elevated counts. It cannot be said that the atypical cases here reported fitted these criteria. It may be contended that an infectious process of widespread epidemic nature will vary in its characters according to prevalent pathogens capable of producing mixed or secondary infections. It is of interest to note that Weir and Horsfall¹⁴ have recovered from cases of acute pneumonitis a virus causing pneumonia in the mongoose.

Recent statistical studies for 1937-39 show that the mortality rate for pneumonia at large has definitely fallen. The low mortality rate in our group (one death in 79 cases of lobar pneumonia and one other death in 92 cases of other pneumonia) suggests the very favorable reaction of presumably healthy young adults to respiratory infection, including pneumonia due to pneumococci or other organisms. Chronic illness as in the aged and debilitated, important as predisposing causes and increasing the severity of pneumonia in a general hospital service, were absent. With then due appreciation of the favorable expectancy in such a selected age group, early hospitalization of cases of respiratory infections with systemic and febrile reactions is considered an ideal procedure which would in any age group reduce the average severity of infection and tend to lessen the mortality rate. Early hospitalization is of particular value in a group whose individuals are often away from home, who live in dormitories, fraternity or rooming houses, and who would therefore have greater hazard of contact infection of companions.

The experience herein reported emphasizes that infection of the respiratory tract must be studied clinically and approached experimentally in view of anatomical and of physiological relationships of the tract as a whole. Pneumonia of all types, including even pneumococcal lobar pneumonia, is related not infrequently to preceding infection (usually the common cold), the lesion of which is often in the nasal or pharyngeal mucosa. Thus 52 per cent of lobar and 74 per cent of other pneumonia were preceded by upper respiratory infections. It should be pointed out, however, that an increase in upper respiratory infections in a given period

does not necessarily call forth an increased amount of pneumonia, according to our statistics. For instance, the incidence of acute respiratory infections of the common cold type in 1939-40 was comparatively high, although that of pneumonia was the lowest experienced. It appears that in a group made more susceptible by acute infections of the upper respiratory tract the frequency of pneumonia depends upon epidemic and other factors. In epidemics, influenza virus infection may be a predisposing cause of pneumonia due to other agents; other epidemics related clinically to influenza but unknown etiologically may act similarly. Experimental evidence that shows necrotizing changes in the nasal mucosa incidental to influenza virus infection in animals has important implications as to the mechanism of the development of secondary infections following influenza and the common cold in the human.

SUMMARY AND CONCLUSIONS

1. Twenty to 43 per cent of all admissions to the Students' Health Service hospital during the past six years have been cases of acute respiratory infections, including pneumonia. These illnesses have been classified into four main groups for analysis.
2. The most frequent respiratory infections requiring hospitalization are the common cold and its complications (coryza, pharyngitis, laryngitis, and tracheo-bronchitis).
3. Increases in incidence of influenza and influenza-like infections have been noted on alternate years.
4. The incidence of follicular tonsillitis and follicular pharyngitis varies inversely with that of the influenza and influenza-like infections.
5. In an analysis of the leukocyte counts in the various diseases, it was found that the highest counts occurred in follicular tonsillitis and pharyngitis, while the influenza group had the lowest counts. However, there was a distinct tendency toward a higher count in the influenza group during the year 1937-38 as compared with other years.
6. Follicular tonsillitis and follicular pharyngitis typically have a short course with crisis-like defervescence regardless of treatment, and complications are uncommon in this age group.
7. During the past 10 years there have been 79 cases of frank lobar pneumonia in this group, with only one death. This low mortality is believed to be due largely to the great resiliency of young adults dealt with, the relative lack of chronic predisposing factors, and the promptness with which the patients were hospitalized after the beginning of their infections.
8. During the past six years there have been 92 cases of pneumonia other than frank lobar, as compared with 61 cases of lobar pneumonia during the same period. Only one death occurred in these 92 cases.
9. About one-half of the cases of lobar pneumonias and about three-fourths of the cases of other pneumonias have had histories of preceding upper respiratory infections. However, an increased incidence of upper

respiratory infections does not necessarily cause an increase in the incidence of pneumonia.

10. During the past two years, particularly during the school year 1938-39, there has appeared an increased incidence of "atypical pneumonia", while the cases of frank lobar pneumonia have decreased. The most common etiologic agent isolated from the sputum in these atypical cases has been the streptococcus, rarely the pneumococcus. The disappearance of pneumococci at this period was a striking but unexplained biological fact.

11. Specific serum therapy and chemotherapy have produced a lessening in intensity and duration of pneumonia. However, the low mortality found also in those who did not receive these forms of treatment emphasizes the importance of considering the age factor in evaluating the results of special therapy of pneumonia in large groups.

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AN APPEAL FOR OLD MAGAZINES

The Minneapolis Public Library has sent out an appeal for magazines and used books for the Reception Center at Fort Snelling, Minnesota, where new recruits are outfitted before being sent out to camp. The Chaplain tries to supply every man when he leaves with a bundle of reading matter.

In the Medical Arts Building, Minneapolis, magazines from a number of doctors' offices are being collected the first Wednesday in each month by a Library truck and delivered to Fort Snelling. Any type of magazine in which men might be interested is wanted, and offers a way to dispose of otherwise useless accumulations.

For information, call Miss Sidney Pattee, at MAin 8259.

Intracapsular Cataract Extraction*

Walter H. Fink, M.D.

Minneapolis, Minnesota

IN the field of ocular surgery, cataract extraction is considered by most surgeons the most intricate type of eye operation. Although the average case involves a comparatively slight risk, the operator is occasionally confronted with a complicated case in which the operative hazard is greater than usual.

To cope with these more difficult problems much co-ordinated effort has been put forth. As the result of this we have at present many improvements in technic. Valuable safeguards have been introduced which have materially lessened the hazard, resulting in a higher percentage of better visual results. Measures such as proper preoperative care, better anesthesia and corneal sutures are examples of the steps utilized; but the most valuable contribution, according to many able surgeons, is the intracapsular type of extraction.

Because the importance of the intracapsular method is not fully appreciated, it seems justifiable to emphasize repeatedly its value in certain types of cataract cases. To illustrate in a concrete way its application to one type of cataract, the following case is presented.

The patient was a woman, 48 years of age. She gave a history of failing vision in both eyes for a period of three years. At the time of examination her vision was reduced to the point where she was practically incapacitated.

Examination revealed bilateral incipient cataract changes confined to the central portion of the lens. The remainder of the lens was practically clear. Otherwise the eyes showed no evidence of pathology. Her general examination, likewise, showed her to be normal, with the exception of a slight reduction in the blood calcium.

Because of the marked reduction in vision, operation was recommended in spite of the fact that the outer half of the lens was not involved.

The right lens was removed by the intracapsular method. The recovery was uneventful and in six weeks a glass was fitted which gave her normal vision. The other eye will be operated later.

According to most operators, this case was more complicated than the usual, due to the fact that the cataract was not mature. Although the central portion of the lens was involved the remainder of the lens was clear. As is generally known, there are two methods of removing such a cataract: (1) the intracapsular method and (2) the extracapsular method. With the former, the entire lens including the capsule is removed, whereas in the latter, the lens cortex is extracted, leaving the capsule.

The advantages of the intracapsular method in cases of this type may be summarized as follows:

1. The operation can be performed before the cataract is fully mature, thus saving many months of delay. During this period of waiting the patient is incapacitated both socially and economically.

2. The operation is a one step procedure and repeated needlings are not necessary.
3. There is less trauma to the eye during the operation because fewer manipulations are necessary.
4. Properly done, the danger of vitreous loss is no greater.
5. The reaction following the operation is slight.
6. The healing stage is shorter and much less discomfort is experienced.
7. There is less danger of postoperative complication such as iritis and glaucoma.
8. The glasses can be fitted much sooner.
9. The visual results are uniformly better.

The disadvantages of the extracapsular method in a case of this type are:

1. The uninvolved lens material is difficult to remove even though irrigation is used.
2. If the lens cortex is not all removed it prolongs the convalescence for many weeks during which time the eye remains in an irritated state.
3. This prolonged reaction may lead to iritis or glaucoma which permanently reduces the visual efficiency.
4. The operation involves more manipulations and therefore more trauma to the eye.
5. The capsule is not removed and may require repeated needlings which in addition to trauma to the eye, exposes it repeatedly to the possibility of infection.
6. The needling operation tends to injure the vitreous.
7. A greater reaction is present and a longer convalescence.
8. The fitting of the glass is further delayed and the visual result is uniformly not as good.

CONCLUSION

The intracapsular method of extraction offers many advantages in dealing with certain types of cataracts. When properly done, the eye is exposed to less trauma and less danger of infection. The convalescence is shorter and the visual results are better.

DISCUSSION

DR. JOHN F. CURTIN: I would like to ask Dr. Fink if he feels that the results obtained by this method are as good as those by the extracapsular method. Does he know of any statistics that will prove that results by the intracapsular extraction are better over a period of time than those by the extracapsular method?

DR. WALTER H. FINK: Those who have had extensive experience with the intracapsular extraction have had no difficulty in this respect.

*Read before the Minneapolis Academy of Medicine, December 12, 1940.



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CONTENTS AND CONTRIBUTORS

This special tuberculosis number of the JOURNAL-LANCET was prepared to aid in the Early Diagnosis Campaign of the National Tuberculosis Association. For many years the April issue of the JOURNAL-LANCET has been devoted to this cause. The introduction by Dr. Kendall Emerson, Managing Director of the National Tuberculosis Association, clearly and concisely presents the responsibility of every physician with reference to early diagnosis of tuberculosis.

From across the Pacific, Kuo presents a program for controlling tuberculosis in Peiping, China, which any community in the United States could adopt with pride. This work is being done in the face of serious handicaps, including war, widespread disease, and inadequate hospital facilities. Dr. Kuo is associated with Dr. Ch'iu, whom many readers of the JOURNAL-LANCET had the pleasure of meeting when he visited the United States

in 1938, and some of whose articles they have read in medical journals of this country.

Dr. Simons presents the ideal method of pursuing tuberculosis whenever a member of a family is found to have this disease. When all physicians adopt the same painstaking procedures, tuberculosis will rapidly disappear from their communities.

Drs. Pollak and Cohen discuss a procedure for solving one of the most serious problems in the entire field, namely, tuberculosis among the members of hospital and sanatorium personnel, particularly student nurses. Their previous publications on this phase of tuberculosis work are also of great value.

For many years we have strongly advocated the adequate examination of everyone in a given area as the only completely satisfactory method of controlling tuberculosis. It is heartening to read the article by Dr. Davies, who has surveyed the entire population of four

townships. He has completely negated the time-worn argument that so few persons will accept the tuberculin test as to make it an impractical procedure. Indeed, he found that an insignificant 2 or 3 per cent actually refused the test. Moreover, he points out that the examination of only contacts of known cases of tuberculosis is inadequate.

Dr. Lyght, Chairman of the Tuberculosis Committee of the American Student Health Association, presents the report of the tuberculosis activities in colleges and universities for the academic year, 1939-1940. He lays down the fundamentals of tuberculosis control among college students, which are applicable to any other group. The number of demonstrable clinical lesions found among college students during the year far more than justifies the effort and expense of the program.

Collapse therapy is capable of controlling many tuberculous lesions among students as it is among other persons with tuberculosis. Indeed, ambulatory artificial pneumothorax suffices in properly selected cases. Unfortunately, some students on admission already have disease so extensively developed that they require sanatorium care and even major surgical operations, as is pointed out by Alexander.

Smith calls attention to the importance of collapse therapy in the anti-tuberculosis program of Puerto Rico. After all, the chief objects of treating tuberculosis are, (1) to convert the individual's disease from a contagious to a non-contagious stage or preventing it from becoming contagious, and (2) to continue or restore the individual's working capacity. Several thousand patients in Puerto Rico have been treated by ambulatory artificial pneumothorax with excellent results, as has been described in previous issues of the *JOURNAL-LANCET* by Dr. Rodriguez Pastor. The sanatorium and hospital beds are reserved for patients whose disease is too extensive for such treatment or in whom it can not be administered because of adhesions. Dr. Smith describes the extreme importance of chest surgery in such cases. Many persons whom he has treated in this manner are now working and are not spreading tubercle bacilli to their associates.

At this moment the control of tuberculosis is in the palm of the medical profession. To control it, however, we must abandon fads and fancies, examine everyone with tuberculin, make, periodically, X-ray films of the chests of all reactors, and examine completely by laboratory and clinical methods those who present shadows which might be due to tuberculosis. Methods of treating clinical tuberculosis have advanced almost as rapidly as methods of diagnosis. Therefore, we are in a position to treat or isolate tuberculous individuals whenever they are found. To a large extent the success of treatment is dependent upon its institution before the disease has reached an advanced stage. Thus, the Early Diagnosis Campaign of the National Tuberculosis Association deserves the support of every physician and should be carried out every day of each year.

A subject closely allied with tuberculosis, namely, acute respiratory infections, is discussed in this issue by

Drs. McKinlay and Cowan. This is based on a large experience and most careful work. Often it is necessary to differentiate these conditions from tuberculosis and occasionally adequate examination of the sputum as practiced by the Minnesota State Department of Health reveals coexistence of pneumonia and previously unsuspected chronic, pulmonary tuberculosis. McKinlay and Cowan discuss specific serum therapy and chemotherapy in pneumonia, which promise to aid the medical profession in winning another great victory over disease.

J. A. M.

TUBERCULOUS PERICARDITIS

Among the chief causes of pericarditis are rheumatic fever and tuberculosis; the latter is by far the least common. In spite of its relative infrequency, tuberculous pericarditis is not to be regarded as a rare and unexpected condition. This form is the most serious type of tuberculous infection of the serous membranes and in the past has been looked upon as a condition which in most instances progressed to a fatal outcome. This view was adequately supported by pathological evidence which indicated that the disease was highly fatal in its active stage and only occasionally did the process become arrested and heal. However, in very recent years a new avenue of approach has made possible a more optimistic attitude not only in the recognition of tuberculous pericarditis but also in its treatment. This has come about largely through the excellent and gratifying reports which have appeared in the literature within the past ten years concerning the syndrome of constrictive pericarditis (Pick's disease), a clinical entity to which tuberculous pericarditis may give rise.^{1,2,3}

In brief, the syndrome of constrictive pericarditis develops from a pathological process which causes a thickening and contraction of the pericardium about the heart and great vessels, with the result that the heart becomes imprisoned as it were in a rigid case so that the diastolic filling is seriously impaired. As a consequence, obstruction of inflow of venous blood to the heart occurs and in a matter of time venous stasis develops to a marked degree. The clinical features which characterize this "inflow stasis" are engorgement and distention of the veins of the neck, dyspnea, hepatic enlargement, ascites, pleural effusion, and edema. Because insufficient blood enters the heart, it is obvious that the cardiac output will be correspondingly decreased. Therefore, in addition to the above findings, other signs are encountered such as a small pulse, small pulse pressure, and not infrequently a paradoxical pulse. As a rule, the cardiac shadow is not enlarged, and when the pulsatory activity of the heart borders are observed under the fluoroscope, the heart appears fixed in position and the pulsations of the heart chambers are absent. The electrocardiogram usually reveals a rather typical pattern of low voltage and flat or inverted T waves.

That tuberculosis of the pericardium can cause compression of the heart need no longer be doubted. Furthermore, from a review of the recent literature it would appear likely that tuberculosis accounts for the majority

of cases of chronic constrictive pericarditis of Pick.^{4,5} Blalock and Levy⁵ have pointed out that of the nineteen patients with undoubted constrictive pericarditis which were studied in the Vanderbilt Hospital, eleven were proved to be tuberculous in origin, and five others were believed to be tuberculous. It is now agreed that there is only one satisfactory treatment for tuberculosis of the pericardium when constrictive phenomena develop, and that is decortication of the heart (pericardectomy). Indeed it can be truthfully said that this operative procedure constitutes one of the greatest advances in the surgical treatment of heart disease. Not only does pericardectomy afford temporary relief, but in many instances this operation has brought about permanent cure.

In most instances the constrictive phenomena in tuberculous pericarditis is encountered in those cases where the tuberculous process has become entirely inactive and where scar tissue has contracted about the heart, producing cardiac compression. However, cases are occasionally encountered in which the disease is still active and signs of constriction are already developing. If on careful observation it is evident that the patient's condition is steadily growing worse and if venous pressure rises in spite of the fact that the heart-pericardial shadow has decreased in size, it is our impression that pericardectomy should be performed. To withhold surgery in this group of cases spells a quick and almost certain death. From our experience and those of other observers,⁵ pericardectomy under these circumstances gives promise of temporary or even possible permanent relief.

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PHILLIP HALLOCK, M.D.

THE VETERINARIANS' CONTRIBUTION TO TUBERCULOSIS CONTROL

In November 1940 the United States Bureau of Animal Industry announced that every state in the Union had received the modified accredited rating with reference to tuberculosis among cattle. This accomplishment was fraught with great difficulty and with long years of persistent effort. The first tuberculin tests were administered to cattle in this country in 1892. Immediately, postmortem examinations of the animals which reacted confirmed the findings in Russia, Denmark, and Germany, with reference to specificity of the test. During the next twenty-five years, millions of tuberculin tests were administered to cattle and the great number of postmortem examinations proved the accuracy of the test. The first herd was accredited in the United States in 1908. One year later all of the cattle in the District of Columbia were tested; approximately 19 per cent reacted. These were immediately removed from the herds. By 1916 only 1 per cent of the cattle of the District of Columbia reacted; in 1920, 0.25 per cent; in 1925 and subsequently no tuberculin reactors have been found in the District. Thus, it was proved that

it is possible to completely eradicate tuberculosis from a political division of the country. As the work progressed in the District of Columbia, the idea evolved of controlling tuberculosis among cattle on the area plan, using the county as the unit. In 1917 the United States Bureau of Animal Industry launched a nation-wide campaign against tuberculosis among cattle.

The veterinarians tried every method of administering tuberculin and in 1920 the intracutaneous method was adopted as the most satisfactory. The veterinarians had a far-reaching vision of tuberculosis control. They regarded every animal which reacted to tuberculin as having tuberculosis in some stage of its development; therefore, they recommended that all reactors be slaughtered. It was decided that when testing of the cattle of a county revealed that not more than one-half of 1 per cent reacted, that county would be granted the modified accredited rating. By July 1923 seventeen counties qualified and were so rated. In October 1928 the entire state of North Carolina and one year later the state of Maine were rated as modified accredited areas. The campaign rapidly gained momentum. Cattle owners nearly everywhere clamored to have the tuberculin test administered to their herds. From 1924 to 1934 there were nearly always 2,000,000 to 4,000,000 cattle on the waiting list. In 1935, alone, the veterinarians administered the tuberculin test to 25,000,000 cattle. One state after another was added to the modified accredited list. Between 1917, when the campaign began, and 1940, when the last county was accredited, approximately 230,000,000 tests were administered to the cattle of this country and more than 3,768,000 reactors were slaughtered and examined at postmortem.

The total cost of this accomplishment for administering tuberculin tests, reimbursing owners, and all other activities, was less than \$300,000,000. A recent nationwide survey disclosed that only 0.4 of 1 per cent of the 67,000,000 cattle of this country react to tuberculin. The veterinarians consider that as long as there is a single reactor in the nation, there is a tuberculosis problem. Therefore, they are continuing periodic testing with tuberculin and apparently the time is not far distant when large areas of the country will have completely eradicated tuberculosis from the cattle herds. As significant as is this great economic accomplishment, it is secondary to its public health aspect. Indeed, the veterinarians' chief thought in controlling tuberculosis among cattle, from the very beginning, was the prevention of the spread of bovine tuberculosis to man. While it was firmly believed for several centuries that the bovine type of tuberculosis is transmissible from animals to man, it was not until 1901 that Ravenel presented indisputable evidence of this occurrence. With accurate methods of typing tubercle bacilli in recent years, disease in humans caused by the bovine type of tubercle bacillus has been found to be far more serious than was previously suspected. In countries where tuberculosis has not been controlled among the cattle herds, pure cultures of the bovine type of tubercle bacillus have been recovered from approximately 50 per cent of humans with

tuberculosis of the skin and cervical lymph nodes; 25 per cent of tuberculous meningitis; 20 to 25 per cent of tuberculosis of the bones and joints and urogenital tract; and from 1 to 6 per cent of pulmonary tuberculosis. Moreover, pure cultures of the bovine type of tubercle bacilli have been recovered from the lesions of primary tuberculosis complexes. The fact has also been established that the bovine type of tubercle bacillus in the human body sensitizes the tissues to tuberculin, the same as the human type. In this country wherever tuberculosis was driven from the cattle herds, there soon followed a sharp decrease in the incidence of tuberculous infection, as manifested by the tuberculin reaction, among children and a decline in morbidity and mortality from tuberculosis. Therefore, a considerable part of the reduced incidence of tuberculosis in its various stages in this country must be credited to the work of the veterinarians. In all the recorded history of mankind, the control of tuberculosis among cattle in the United States stands pre-eminently above any other accomplishment in the tuberculosis field.

Of great importance is the fact that the veterinarians have pointed the way for the control of tuberculosis caused by the human type of tubercle bacillus in man. Anyone who will carefully study and analyze the veterinarians' programs will immediately discard fads and fancies, such as seeking for tuberculosis in certain groups, and will strongly advocate the administration of the tuberculin test to everyone in a community or a political division, with adequate and periodic examina-

tions of all reactors. When clinical disease is found, isolation or treatment will ultimately prove as effective as the veterinarians' methods.

J. A. M.

FROM PIRQUET TO MANTOUX

As everyone knows, the Mantoux test is the refined outgrowth of the observations of Dr. Clemens von Pirquet, a docent at the time in the Escherich Clinic at the St. Anna Kinderspital in Vienna. While a young man of 30, Pirquet's attainments attracted the attention of postgraduate students, and he was induced to give a course to five physicians monthly in the ambulatorium and hospital wards from 4:00 to 6:00 p. m. at an honorarium of 1,000 kronen. Just when he actually made his discovery and published his findings, we do not know, but in one of these courses beginning May 14, 1905, we saw him on several occasions giving a demonstration of the test which later bore his name.

It was first found that a solution of old tuberculin dropped in the eye of a tuberculous child caused conjunctivitis. The reaction was often so severe that other sites were sought where the resultant irritation might not be so unpleasant for the patient. Besides Pirquet, Lautier, Lingnieres, Moro, Mendel, and Mantoux did much work on cutaneous, intracutaneous, and percutaneous tests. The Mantoux, or intradermal method, having been found most satisfactory, is now universally employed in routine examinations.

A. E. H.

Book Reviews

Office Urology, with a Section on Cystoscopy, by P. S. PELOUZE, M.D., Assistant Professor of Urology, University of Pennsylvania; Special Consultant to United States Public Health Service; Member of Board of Directors, American Social Hygiene Association and American Neisserian Medical Society; 766 pages, with 443 illustrations, 19 in color; Philadelphia & London: W. B. Saunders Company, 1940. \$10.00.

Dr. PELOUZE has presented another book which can take its place beside his classic work on gonorrhea as an authoritative consultant to the practitioner who treats genito-urinary diseases. This volume could be considered as the young urologist's substitute for the constant presence at his side of a practical "chief" of many years' experience and with the "ability to teach."

To the hospital house staffs, the value of this book lies in the informative concise consideration of all details in urologic diagnosis and "non-operative" treatment, especially necessary in hospitals where responsibility in the dispensary is delegated to internes and residents.

The practical aspects of dealing with urinary tract infections are outlined. There is a masterful discussion on the modern trends in treatment of gonorrhea, bringing the author's well-known treatise up to date with the recent advances in sulfonamide therapy. He is optimistic in regard to the newer drugs, but waxes pessimistic in regard to the problem of determination of cure after chemotherapy.

Although Dr. PELOUZE philosophizes on the pitfalls and controversial opinions in the field of urology, he presents his own viewpoints in detail, gathered from a vast practice as a "Medical Urologist."

This book is very readable and the various sections are well-organized. It includes details from "office arrangement and equipment" to the avoidance and treatment of "reactions after cystoscopy." The author has prepared many of the illustrations himself and has not hesitated to reprint the best of those from other urologic textbooks.

The 167-page section on cystoscopy is undoubtedly the most valuable monograph on this phase of urology. Of interest are the author's unusual comments that cystoscopy in the presence of active pulmonary tuberculosis is contraindicated.

Child Care and Training, by MARION L. FAEGRE, Assistant Professor of Parent Education, and JOHN E. ANDERSON, Director of the Institute of Child Welfare, University of Minnesota; fifth edition, 320 pages. Minneapolis: The University of Minnesota Press: 1940. Price \$2.50.

This work is essentially an outgrowth of the Institute of Child Welfare at the University of Minnesota. The need for five editions testifies to its popularity. The present edition differs from its predecessors chiefly in the inclusion of recent work on behavior of children. Drs. FAEGRE and ANDERSON write for every parent to read and understand but there is no hint of over-popularizing or writing down to the public. The book is packed with practical suggestions for meeting the problems that arise in bringing up children. The writers present the modern scientific methods of child rearing, based on recent psychological and physical studies. The chapters on emotional, and eating, and sleeping habits could be read with profit by every parent. Physicians can practice prophylactic medicine by recommending the book to parents and others.

TRANSACTIONS OF
THE MINNEAPOLIS ACADEMY OF MEDICINE

(Minneapolis Clinical Club)

Founded January 17, 1920

STATED MEETING HELD DECEMBER 12, 1940

The President, Dr. Lawrence R. Boies, in the Chair

HYPERINSULINISM

HEWITT B. HANNAH, M.D.

ORWOOD J. CAMPBELL, M.D.

(Case Report)

Dr. Hewitt B. Hannah reported the case of a man, 55 years of age, who presented himself because of disturbances in his mentality which came periodically over a period of a year. The attacks were severe and associated with unconsciousness and convulsions.

Examination showed very definite evidence of periodic hypoglycemia. The patient was referred to Dr. Orwood J. Campbell for further study and surgery. An insulogenic tumor was found in the body of the pancreas and was removed. The patient made a complete recovery.

(The case will be reported in detail.)

DISCUSSION

Dr. J. S. McCARTNEY: Dr. Campbell has done a good job of the review of this material in connection with these island tumors. Some of them are malignant. The only comment I have to make is in reference to the hyperplasia to which he referred. We know that in diabetics only about one-half of the time can the pathologist demonstrate any change in the islands by ordinary methods. Sections do not reveal changes in function although we know quite certainly that there is some functional change in the islands in diabetes. It may be that in some cases of hyperinsulinism without adenoma or obvious hypertrophy of the islands there is an actual over-function. One definite proof that the islands are over-size and they do hyper-function is that some children of diabetic mothers die of hypoglycemia after being born, and in some of them we can find very large islands.

SOME PROBLEMS IN THE TREATMENT OF
GYNECOLOGICAL MALIGNANT DISEASE

J. L. MCKELVEY, M.D., C.M.†

(Abstract of Inaugural Paper)

The general trends in the determination of radiation dosages and their control is discussed. Massive dose therapy applied with accuracy is recommended. Since such therapy requires adequate histological, gynecological and radiological control, it is reasonable to require that each specialist obtain a working knowledge in the other fields.

The reasons for hospitalization of patients undergoing such therapy are discussed and routine institutionalization urged.

Some of the factors for the avoidance of variable factors in radium and radon irradiation are discussed and recommendations made.

A few specific problems which are attracting interest at present in regard to cervical carcinoma and adenocarcinoma of the body of the uterus are discussed.

DISCUSSION

Dr. H. M. N. WYNNE: Dr. McKelvey brings out many points for discussion in his interesting paper.

In our private work, most of us in the past have leaned heavily on our pathologists and roentgenologists in mapping out the plan of procedure and dosage for these patients and I believe we will continue to do so in the future.

†Department of obstetrics and gynecology, University of Minnesota.

There is one thing that we have to remember, our roentgenologists are legally responsible for results if they over-radiate and, therefore, they have to approve of the treatment outlined.

I was greatly interested in Dr. McKelvey's reference to carcinoma in young women. I have had very little experience with carcinoma of the cervix in women under 30 and I have had none in private practice. Whether or not radiation therapy followed by the Wertheim hysterectomy will increase the salvage will be established in time.

Institutional treatment is undoubtedly the best method of handling carcinoma cases. It seems at present absolutely impossible to obtain this ideal. Some method may be worked out in the future. However, there are other diseases in which better results can be obtained by institutional treatment and we must consider human ills as a whole rather than limit ourselves to the consideration of the carcinoma patient alone.

Dr. O. F. ROBBINS: There are a great many questions one would like to ask Dr. McKelvey, but he mentioned particularly the necessity for close coöperation between the gynecologist, the roentgenologist and the pathologist, and I wondered if he meant the coöperation with the pathologist in the grading of tumors. If they have preliminary X-ray radiation is it necessary to pay attention to the bacteriology of the cervix before the radium therapy?

Dr. CYRUS HANSEN: I wish to congratulate Dr. McKelvey on his excellent paper. There are several things that occurred to me as he was reading it that may be worth considering. One thing I was very much pleased with was his emphasis of the biological dose rather than the physical dose. We find in our treatment that we cannot apply the same type of treatment to every patient; the individual physiology of the body does not stand for it. All patients do not take the same daily dose, some take more and some take less which goes back to the biological standard of tolerance. Clinically this enters into consideration and our criteria for determining the dosage especially, because, as Dr. Wynne says, we are legally responsible for local effects.

Another thing which we have always spoken against and which Dr. McKelvey emphasizes is the use of large radium needles. These have no place in present modern treatment of carcinoma. The maximum sized needle that I believe should be used is a 5 mgm. needle and that should be a fairly long one where the radium is not centered over a very small point. It is needless to state that the sheath should be of platinum.

As Dr. Wynne said, hospitalization is ideal but in private work it becomes economically impossible but I think our results improve with hospitalized cases.

I again wish to congratulate Dr. McKelvey on his very nice presentation.

ERNEST R. ANDERSON, M.D.,

Secretary

At the meeting of the Minneapolis Academy of Medicine held on Thursday, March 13, at the Minneapolis Club, Dr. Edwin C. Hamblen, associate professor of obstetrics and gynecology at Duke University School of Medicine, and chief of the endocrine division of Duke hospital, Durham, North Carolina, addressed the members on "The Sterol Family."

Future Meetings

**TENTATIVE PROGRAM
1941 ANNUAL MEETING
NORTH DAKOTA STATE MEDICAL
ASSOCIATION
Grand Forks, North Dakota**

Monday, May 19, 1941

Meeting of House of Delegates.
Annual Meeting of North Dakota Health Officers Association.
Evening Meeting, open to public. Main address by Dr. Morris Fishbein, Chicago, Illinois.

Tuesday, May 20, 1941

7:30—Committee Breakfasts.
8:30—Registration at Convention Hall.
9:00—Exhibits.
9:45—Paper: "Vitamins"—Dr. E. H. Rynearson, Rochester, Minnesota.
10:15—Intermission.
10:30—Symposium on Heart Disease: "Valvular Heart Disease"—Dr. Paul Rowe, Minot; "Cardiac Arrhythmias"—Dr. W. H. Long, Fargo; "Coronary Disease"—Dr. J. O. Arnsen, Bismarck; "Pathology of Heart Disease"—Prof. E. T. Bell, University of Minnesota.
12:15—Roundtable Luncheons. Subjects: "Renal Disease and Hypertension"—Prof. E. T. Bell, University of Minnesota. "Diabetes"—Dr. E. H. Rynearson, Rochester, Minnesota.
1:30—Moving Picture—"Traumatic Surgery of Extremities."
2:15—President's Address — Dr. C. J. Glaspel, Grafton.
2:30—Symposium on Traumatic Injuries: "Knee"—Dr. Edward Parnall, Minot; "Wrist"—Dr. H. J. Fortin, Fargo; "Ankle"—Dr. J. C. Swanson, Fargo.
3:30—Paper: "What the North Dakota Compensation Bureau Expects of the Physician"—Dr. W. H. Bodensab, Bismarck.
4:00 to 11:00 P. M.—Golf, Informal Supper (Smorgasbord), and entertainment at the Grand Forks Country Club.

Wednesday, May 21, 1941

9:00—Moving Picture: "Vaginal Repair—Cystocele and Rectocele."
9:30 to 10:00—Paper: "Therapeutic Procedures in Chronic Rheumatoid Disease"—Dr. MacNider Weatherby, University of Minnesota.
10:00 to 10:15—Open.
10:15 to 10:30—Visit Exhibits.
10:30 to 11:00—Paper: "Cancer of the Large Bowel"—Dr. W. A. Fansler, Minneapolis.

11:00 to 11:30—Paper: "Diseases of the Skin"—Dr. H. E. Michelson, University of Minnesota.

11:30 to 12:00—Paper: "The Physician in the Selective Service Program"—Captain R. A. Bier, Medical Corps, Washington, D. C.

12:00 to 2:15—Roundtable Luncheons. Subjects: "Office Treatment of Ano-rectal Disease"—Dr. W. A. Fansler, Minneapolis; "Chemo-therapy"—Dr. M. Weatherby, University of Minnesota; "Common Skin Lesions of Office Practice"—Dr. H. E. Mickelson, University of Minnesota.

2:30 to 2:45—Paper: "Sex Hormones"—Dr. J. L. Conrad, Jamestown.

2:45 to 3:30—Paper: "Management of the Breech"—Dr. W. A. Coventry, Duluth, Minnesota.

3:30 to 4:00—Open Forum on Obstetrical Problems—conducted by Dr. Coventry, Duluth, Minnesota.

Secretary's Letter

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

Plans are about completed for the annual session of the South Dakota State Medical Association which will convene in Mitchell May 18, 19 and 20, 1941. Business sessions will be held on the afternoon and evening of the 18th with clinical sessions on the 19th and 20th. Clinicians who will appear will include Dr. Henry E. Michelson in Dermatology, Dr. Vernon L. Hart in orthopedic surgery, Dr. Robert G. Allison in Radiology, Dr. James B. Carey in Internal Medicine, all of Minneapolis, Dr. Frederick Foley of St. Paul in Urology, Dr. Sumner L. Koch of Chicago in Surgery, Dr. Kenneth C. Swan of Iowa City in Ophthalmology, and Dr. J. C. Ohlmacher of the University of South Dakota Medical School. Programs will be mailed the latter part of April.

Council Meeting, February 5, 1941

Special meeting of the Council of the South Dakota State Medical Association convened at Pierre to consider special problems relative to matters before the legislature and other matters of business.

Present were: Drs. J. D. Whiteside, D. S. Baughman, C. E. Robbins, J. H. Lloyd, W. E. Donahoe, R. V. Overton, C. E. Lowe, Wm. Duncan, J. C. Shirley, O. J. Mabee, B. M. Hart, and C. E. Sherwood. Chairman of the Special Legislative Committee, A. E. Pittenger, and Attorney Karl Goldsmith and J. F. D. Cook, Supt. of the State Board of Health.

Karl Goldsmith discussed briefly Senate Bill 63 which provides that any person who engages in any business or profession requiring a license, without procuring said license may be enjoined from so doing by court order. It was the consensus of those present that this was a good law and should be supported by the medical profession.

He then presented pertinent data concerning S. B. 73 which would permit osteopaths to license themselves to do major surgery on their own qualifications. A general discussion ensued. It was the opinion of those present that especial work must be done and letters written by each physician and his friends to the legislators, particularly Senators, acquainting them with the dangers to the general public should this bill pass.

Chas. Halbkat, president of the State Association of Optometrists, appeared before the council and discussed the problem of that group and presented proposed legislation which

would alter their definition of optometry and change the standards of their profession. One clause would require physicians who desired to do refractions, to obtain a license to do so from the board or they might delegate the licensing to a special board of medical men. It was pointed out that when a physician was licensed he was licensed to treat the human body and all its organs and was therefore also licensed to treat the eye by putting on glasses and that any such clause would be an infringement on the rights and privileges of the physician and the State Board of Medical Examiners. In deference to the opinion expressed by the Council, Mr. Halbakat agreed to strike that portion from his proposed bill. It was moved by Dr. Mabee and seconded by Dr. Lloyd that the final draft of the bill should be O.K.'ed by Karl Goldsmith for the Association if along the lines of the discussion. Passed.

Dr. Shirley presented a message from the Women's Auxiliary asking that the physicians of the state urge their wives to get behind the organization particularly in those districts where the Auxiliary is not organized. He pointed out that the Auxiliary was nationally working to assist the profession in the fight against "Political Medicine," that locally they could do much, if organized, to create public opinion favorable to the profession and help in our legislative battles. The organization is also interested in developing a Benevolent Fund which will be used to aid distressed physicians or their families. This has already been started and should have the support of every medical man and his wife.

The Secretary presented some correspondence he had had with the National Youth Administration office in South Dakota, concerning a health set-up providing for physical examination for all youth in this set-up.

Meeting was then adjourned for the members to go over to the State House and interview members of the legislature.

C. E. SHERWOOD, *Secretary.*

SOUTH DAKOTA MEDICAL AUXILIARY

The Executive Board of the South Dakota State Medical Auxiliary met at the Marvin Hughitt Hotel, Huron, March 15, with the president, Mrs. R. A. Buchanan, in the chair. Short reports were made by the following officers: Mrs. F. C. Nilsson, Mrs. G. H. Gulbrandson, Mrs. B. M. Hart, Mrs. J. C. Hagin, Mrs. J. C. Shirley, Mrs. A. C. Johnson, Mrs. N. K. Hopkins and Mrs. M. Pangburn.

An interesting and instructive letter was read from the president of the State Medical association, Dr. B. M. Hart.

Committees were appointed and the president discussed plans for the State Medical Auxiliary meeting at Mitchell, May 18, 19 and 20.

MRS. G. E. BURMAN, *Publicity Chairman.*

News Items

Dr. Arthur F. Bratrud, assistant professor of surgery at the University of Minnesota, was elected president of the Minneapolis Surgical society at the annual meeting of the group held recently. Other officers are: Dr. Richard Cranmer, vice-president; Dr. Robert McGandy, secretary-treasurer; and Dr. H. M. McPheeters, a member of the council.

Dr. Marjorie K. Smith has been named assistant director of the maternal and child health division of the Montana state board of health. A native of Miles City, Dr. Smith attended Smith college and Tufts' college medical school. She served as physician for the Mississippi State college for women and last year studied at the Massachusetts Institute of Technology, taking the M. I. T. course in public health.

The Minnesota State Medical association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis; Station WLB, University of Minnesota, and KDAL, Duluth. The speaker is William A. O'Brien, M.D., professor of preventive medicine and public health, Medical School, University of Minnesota. The subjects and dates will be as follows: April 5—"Cancer in Women," April 12—"Radium and X-ray," April 19—"When Cancer Begins," April 26—"Tumors of the Mouth."

Dr. E. J. Schmitz has taken over the practice of Dr. Max Kern in Freeport, Minnesota.

Dr. William A. Owens is now practicing in Montevideo, Minnesota, where he is associated with Dr. L. R. Lima. Dr. Owens, who is a graduate of the University of Minnesota Medical school, was on the staff of the General Santa Fe hospital at Topeka, Kansas, before coming to Montevideo.

Dr. Clarence Siegel has been appointed superintendent of the Ottertail county sanatorium to replace Dr. J. C. Webster. Dr. Siegel, resident staff physician at the Glen Lake hospital since 1939, was also associated with the Nopeming sanatorium.

Dr. Raymond Manchester of Minneapolis has purchased the practice of Dr. K. E. Bray at Park Rapids, Minnesota.

Dr. John J. Westra, formerly of Owatonna, Minnesota, has become affiliated with the Muncie clinic in Muncie, Indiana. His practice has been purchased by Dr. Stuart D. Whetstone of Winona.

Dr. W. Cotton, Forsyth, Montana, has been appointed county physician for Wibaux county, to replace Dr. F. E. Noonan, who resigned.

Tuberculosis and its prevention and eradication has been the subject of a conference of Minnesota health leaders in Hibbing, Minnesota, March 25, under sponsorship of the Tuberculosis and Health association of St. Louis county and the Range Medical society. Among those who took part in the program were: Dr. J. A. Myers, professor of preventive medicine, University of Minnesota; Dr. E. A. Meyerding, executive secretary of the Minnesota Public Health association; Dr. Leo Rigler, professor of roentgenology, University of Minnesota; Dr. Hilbert Mark, St. Paul, tuberculosis epidemiologist of the division of preventable disease of the state board of health, and Dr. G. A. Hedberg, Nopeming, Minnesota, assistant medical director of Nopeming Sanatorium.

Plans are on foot to have a bowling tournament during the next meeting of the American Medical Association. It is hoped that teams can be formed representing various states. Physicians who are interested in bowling should contact Dr. Lewis W. Bremerman, 1709 West 8th Street, Los Angeles, California.

This is the *Last Call* for reservations for the Nineteenth Annual Convention of the Woman's Auxiliary to the American Medical Association which will be held at Hotel Carter in Cleveland, June 2 to 6. All Cleveland extends a hearty welcome to you!

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To join staff of mental institution. Must be United States citizen, qualified take North Dakota State Board. Substantial salary and full maintenance in comfortable quarters for party who is unencumbered, fitted by experience and inclined to make the post his permanent work. Address Box 696, care of this office.

POSITION WANTED

Have had two years at Kahler, two at college. Two years O.B. and other nursing; type, can drive a car, do incidental lab work; certified (Mpls. Genl.) for X-ray. I am certain I would prove an office asset. Address Box 676 and let me have an interview.

POSITION WANTED

By Italian woman doctor (and dentist) not licensed in U. S. Can detail, act as receptionist, handle research, sell to professional men. 33 years old, personable, speaks English, French, German, Italian, Roumanian. Practiced in tuberculosis hospital abroad. Seeking part-time work in Twin Cities. Address Box 706, care of this office.

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Office equipment, surgical instruments, Bausch & Lomb microscope, McDannold surgical and gynecological chair, etc., etc. Good state, good city, fine location. Reason for selling, retiring. Address Box 703, care of this office.

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Eight-room up-to-date office building with complete up-to-date equipment in a city in southern Minnesota. \$11,000 yearly gross cash income from general practice. Small cash payment with easy terms on balance. Retiring due to poor health. Address Box 704, care of this office.

POSITION WANTED

Young woman desires position as secretary and receptionist in physician's office. Have had Minneapolis office experience in laboratory and X-ray. Prefer downtown Minneapolis. Address Box 705, care of this office.

POSITION WANTED

In St. Paul doctor's office by resident with experience in surgical (thyroidectomy). My services as receptionist, bookkeeper, office assistant will prove satisfactory and my wage demands are reasonable as main consideration is congenial situation with permanent work. Nine months in last position. Age 25. Let me call for interview. Address Box 707, care of this office.

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Established practice in Wyoming town of 2,000. Standard Oil refinery, railroad division, good irrigated farms, cattle and sheep ranches. Combination two-story brick completely furnished apartment house and doctor's office. Income from apartment house \$190 per month plus office rent and home. Average income from medical practice \$5,000 per year. \$14,000 for doctor's practice, all equipment and furnished apartment house. Selling on account of illness. Address Box 708, care this office.

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"Blind" box numbers are addresses placed on classified advertisements which say "Address Box _____, care of this office." They are used by advertisers to conceal their identity and no information will be given in regard to them by this publication. To answer, write a letter and address it to THE JOURNAL-LANCET, Box No. _____, and mail it or bring it to this office.



Minneapolis, Minnesota
May, 1941

Vol. LXI, No. 5
New Series

Child Psychiatry and Pediatrics

Reynold A. Jensen, M.D.†
Minneapolis, Minnesota

THE FIELD OF CHILD PSYCHIATRY

THE field of child psychiatry is concerned with that large group of children who cannot make an adequate social and emotional adjustment and thus encounter difficulties in the home, in the school or in the community. Children who have fears, phobias or anxieties, who have tics and peculiar mannerisms, who are nervous and enuretic, or who are delinquent, all come within the province of the child psychiatrist. In recent years attention has also been directed toward the child who is evidencing lack of adjustment through somatic complaints of one kind or another.

HISTORICAL BACKGROUND

The first clinic designed primarily to study and treat children was the Chicago Juvenile Psychopathic Institute, now the Institute for Juvenile Research. It was founded by Dr. William Healy in 1909 for the purpose of studying juvenile delinquency. It was he who developed the basic organization of the psychiatric clinics for children.

Such services for children were established on a wider scale by the National Committee for Mental Hygiene with the support of the Commonwealth Fund in 1922 on the basis of extensive surveys among school children during the years 1910-1920 which revealed: (1) "that many behavior problems existed among apparently normal children attending public schools," and (2) "that

†The psychiatric clinic for children and the department of pediatrics, University of Minnesota.

facilities for dealing with these problems were grossly inadequate, in fact, almost nonexistent."¹

Developments in medicine and related fields during the later years of the nineteenth century and the first twenty years of the present one have contributed materially to the emergence of child psychiatry. Perhaps the most significant development was a gradual shift in psychiatry from diagnostic classification to the study of causal factors in mental disease. Freud, Adler, Jung, Janet, Adolph Meyer and Thomas Salmon, to mention only a very few, contributed greatly to the development of a dynamic psychiatry. Interest in the patient as a person brought with it an increasing appreciation of the importance of the early formative years in the life of an individual. This served to stress the importance of childhood. It was during this era that Binet began his research in the field of psychological testing. Likewise during this era, medical and psychiatric social work became a valuable adjunct to medicine and psychiatry. Cannon, Pavlov and others were busily engaged in extensive researches in physiology, defining functional concepts as regards human behavior and its various manifestations under stress and strain. All of these and others stimulated a more objective approach to the study and evaluation of behavior.

ORGANIZATION AND METHODS OF STUDY

The present standard organization of the psychiatric clinic for children is based on the coöperative relation-

ships of the psychiatrist, the psychiatric social worker and the psychologist, who function as a unit.

The method of study of any given case usually proceeds somewhat as follows: (1) An attempt is made to clearly define the presenting problem at the time of referral. The onset of symptom or symptoms, changes and modifications in behavior are all closely scrutinized. This procedure corresponds to the definition of the presenting complaint in medical practice. (2) An attempt is made to secure an accurate definition of the child's developmental and health history, his school progress, etc., with special emphasis on the attitudes of those related to him. Undue pressures in the environment are searched for. This work is usually done by the psychiatric social worker who makes her inquiries of parents, school teachers and others who might contribute information. (3) The child is thoroughly studied from a physical point of view to rule out possible contributing physical factors. Physical examinations are done either by the psychiatrist himself or a pediatricist associated with the clinic. (4) The psychologist evaluates the child's mental capacity, looks for special disabilities and determines his school achievement. In problems arising around vocational guidance his investigations are more extensive. (5) The psychiatrist in friendly interviews with the child attempts to secure insight into his emotional life, personality and patterns of behavior. Procedures employed in direct work with the children vary according to age. In children under ten play is frequently resorted to. With older children a more direct interview technic is used.

TREATMENT

Treatment can be roughly divided into two parts: (1) manipulation or modification of the environment which often includes reshaping the attitudes of those who are closest to the child and (2) work with the child directly in an attempt to relieve such tensions and anxieties as may be producing undesirable behavior.

TRENDS

Initially the objective of child psychiatry was the demonstration to social agencies, including the juvenile court, what child psychiatry could offer in the study and treatment of problem children. Great emphasis was placed on reducing the amount of delinquency through such study.² There has been a gradual shift in emphasis so that at present any child who exhibits difficulty in making an adequate social adjustment is accepted for study and treatment, not to reduce the amount of criminality or psychosis, but to help him for his own sake and for the sake of those immediately associated with him.

During the past several years a new emphasis has been developing, namely, the recognition and acceptance of psychogenic and emotional factors in relation to disease and the disease processes. Strecker³ emphasizes their importance when he suggests that a large percentage of the problems arising in and around acute and convalescent illnesses have their primary origins in the

minds of the patients. That there is a growing interest in this phase of medicine is illustrated by the fact that Dunbar⁴ has collected from the literature written between the years 1910 and 1938, 2,358 titles dealing with psychosomatic relationships. The majority of these have been abstracted and published in a volume, *Emotions and Bodily Changes*. The appearance of a new journal, *Psychosomatic Medicine*, which began publication in 1939, is also indicative of this trend. The impact is beginning to affect the field of child psychiatry by bringing it and pediatrics into a closer relationship. In writing about a closer alignment between the two, Dr. McIntosh,⁵ chief of pediatric service, Babies' Hospital, New York City, suggests that progress in pediatrics has advanced unevenly with greater interest in understanding the basic mechanisms in relation to somatic diseases but with little attention devoted to emotional factors. He feels definitely that the pediatricist should be able to recognize and deal successfully with a large percentage of the psychogenic disturbances which manifest themselves in infancy and childhood.

Within the past few years several new clinics offering psychiatric services to children in hospitals affiliated with University medical schools have been established, one of which is at Minnesota.

THE PSYCHIATRIC CLINIC FOR CHILDREN

The Psychiatric Clinic for Children was established at the University of Minnesota Medical School in 1938. Exclusive of consultations and other clinic services offered, 289 patients were accepted for study and treatment during our first two years. Ages ranged from 3 to 16 years. These patients were referred primarily by social agencies, schools, courts, practicing physicians and the Department of Pediatrics. Of the number accepted, 44 came from practicing physicians and 101 from the Department of Pediatrics, a total of 145 from medical sources. This is a much higher percentage than is usually referred to the community clinic from medical sources.

For purposes of illustrating briefly the methods of study and treatment as well as some of the interesting features of representative children referred to the clinic with somatic complaints, cases will be presented from four common disorders encountered in pediatrics—enuresis, diabetes, convulsions and bronchial asthma. These will show the importance of emotional and environmental factors and the changes which followed when they were recognized and successfully used in a treatment program.

ENURESIS

Enuresis is a problem commonly encountered in pediatric practice. By definition it is persistent wetting which occurs after the age of three. Most often it is nocturnal, although it may be diurnal. The latter is ordinarily associated with some strong emotion such as fear or anxiety. Worries, insecurity and apprehensions play an important role in enuresis, and associated with these is the feeling of guilt usually accompanying the condition.

Fifteen cases of enuresis have been referred to the Clinic. Ages ranged from 3 to 15 years, with two cases under 5, eight in the 5 to 12 range, and five 12 years or over. Intelligence quotients ranged from 72 through 150. Three were definitely retarded, three of average intelligence, and nine were superior. With the exception of one case physical examinations were negative. In each case studied we found severe inter-family tensions ranging from outright desertion to marked parental conflict. In several of the cases there was intense sibling rivalry. Fears, nervousness and night terrors were frequently associated problems. In the eight cases where it was possible to bring about some re-orientation of the family, treatment was successful. It was impossible to effect any modification in the remainder.

To cite one case, B., a male, age 9, was referred to us because of persistent enuresis which had been present most of his life. Physical examination was essentially negative with the exception of a mild hypospadias. All previous treatment had resulted in failure. Our investigations revealed that the emotional tone of the home was extremely tense with much bickering between a neurotic, fearful mother and an unstable father who was apprehensive about his job although he had been consistently employed in a large factory for over ten years. Psychological testing revealed the patient to be an extremely bright child with an I. Q. of over 130. He had a vivid imagination. He was much disturbed by the tensions existing between the father and mother and violently disliked the continuous pressures exerted upon him by the lack of understanding and inconsistencies of both parents. Almost nightly bad dreams revealed a great deal of fear and anxiety. Through intensive interviews with the parents they were given some insight into the disturbance they were creating in the life of this child and they were helped toward a better orientation of their own problems. The boy was given an opportunity to express and discuss his feelings and insecurities. The last report indicates that his enuresis is no longer a problem.

DIABETES

It would appear from the present-day researches that the etiology of diabetes mellitus is not as simple as was formerly believed, namely, a primary disorder of the pancreas. The other endocrines, particularly the pituitary, adrenals and thyroid, as well as the other glands of the body seem to play some significant role in the disease. The importance of disturbed emotions in the production of glycosuria has been amply demonstrated by the intensive researches of Cannon.

Four refractory cases of diabetes mellitus have been studied, two boys of 9 and 15, and two girls of 14 and 15. The youngest boy was referred by the diabetic clinic for study and possible treatment because he "is not able to cooperate in adhering to his diet, tends to feel abused when others insist upon his conforming to it, and does nothing to ward off insulin shock." He repeatedly returned to the hospital in insulin shocks, many of which were expertly faked. He was exceedingly immature in almost every way. In addition, he stole consistently, lied freely and ran away from foster homes.

This boy had been born illegitimate in 1929, a product of incest between the mother and her father. He spent the first year of his life in a hospital, and he was in three foster homes prior to 1932. In all, this patient had had approximately ten different foster home placements and had been admitted to the hospital many times. Emotionally he was extremely conflicted. He insisted no one loved him, often became bitter about his family—who they were, where they were and why they had deserted him. He frequently said he belonged to no one and spoke of suicide on numerous occasions. There is little question

that this boy is a severe neurotic, so much so that psychiatric efforts were futile. At present he is in a state institution. An earlier attempt at psychiatric assistance might have been more effective.

The second boy, age 15, was also referred to the clinic as a diabetic problem. Like the previous boy he had many behavior disturbances, lying, stealing and adjusting poorly in school. He was involved in the juvenile court because of his stealing. This boy had had encephalitis at the age of 11. In the spring of 1938 he developed diabetes. While he had had previous adjustment difficulties, they increased markedly after the onset of diabetes. He was exceedingly resentful of his condition, saying, "I've had it for a whole year and I don't seem any better." Further complications influencing his condition were: (1) strained home economic conditions, (2) his resentment toward his mother whom he genuinely disliked, and (3) the fact that he was retarded mentally. Much of his school difficulty centered around his inability to compete successfully with his classmates. It was not possible to effect any change in this youngster. However, this cursory review amply illustrates the many other variables complicating diabetes.

One of the two diabetic girls was referred because of "pains in her side, brooding and crying spells." She was seclusive and unable to accept criticism and was doing poorly in school. This patient, now 15, had been diabetic since the age of 7. It is interesting to note that the onset of diabetes occurred about the time her parents were divorced. Vividly she recalled her father threatening her with physical injury. Her neurotic mother had heart trouble which necessitated her spending many hours in bed. The mother was also very protective of the patient; she would become extremely angry when the girl would refuse to confide in her. For years the mother and patient have lived with relatives who have apparently resented their presence.

The patient was a shy, timid, nervous girl who had many terrifying dreams. She was unhappy, cried easily and worried excessively over early home experiences and family relationships. Her school work was a constant source of anxiety for she was never satisfied with her average marks. She felt generally inadequate and inferior and had no friends.

Psychological tests revealed that she had superior intelligence, rating an I. Q. of 124 on the Stanford-Binet. During repeated psychiatric interviews she was reassured of her excellent intellectual abilities and given an opportunity to discuss her fears and anxieties. With gradual release of tension came more adequate performance in school and in the home. Outside interests were encouraged and to these she showed slow but steady response. Concomitant with these changes, her diabetes improved and was more adequately controlled.

Our last patient, a 14-year-old girl, was a mild diabetic until the age of 12. The mother had deserted her following the death of her father when she was 2 years old. She lived with her grandparents where she heard much disparagement of her mother. The mother remarried and returned to reclaim her daughter, then 5 years old. The patient clearly remembered an intense emotional scene between the mother and the grandmother which finally resulted in the grandmother's literally throwing the mother out of the house. One night at the age of 12 she slept with her grandfather because she had not been feeling well. The girl awoke in the middle of the night and wanted a drink of water. She called him several times but got no response. He was dead. When she realized this she was thoroughly frightened. By 3:00 o'clock the next afternoon, twelve hours later, she was admitted to hospital in a diabetic coma. Afterwards she was distressed at not being permitted to attend memorial services. In hospital she grieved for her grandfather and became worried about where she was going to live because the grandmother was a semi-invalid. A succession of foster homes was tried. Her insulin requirements rose to over 120 units a day; at one point she was taking a total of 145 units of insulin per day. Her diabetes was extremely difficult to control and she was in hospital no less than eight different times prior to referral to us.

This girl has been followed two years. During that time her admissions to hospital have become less frequent and her insulin requirements have decreased perceptibly. Recently this girl became upset because of a disturbed relationship in her foster home. She promptly got worse and was admitted to hospital for regulation. Following discharge from hospital she was placed in another home which provided more adequately for her own emotional needs. The last check has revealed her daily insulin requirement to be less than 70 units.

While a complete resolution of the emotional conflicts in these last two cases has not been effected, psychiatric study and treatment have been instrumental in initiating an improved emotional state which has resulted in a modification of the disease.

CONVULSIVE SEIZURES

The role of emotional factors in convulsions has been stressed repeatedly. However, few objective evaluations of their importance appear in the literature. One of the latest and most complete is by Cobb⁶ in which he evaluates the use of psychotherapy in 45 of his epileptic patients who were selected for his study on the basis of three criteria: (1) they had been seen by him within the last three years; (2) they had been seen repeatedly; and (3) they had received intensive therapy. Psychiatric treatment was of four kinds: (1) social corrective (modifying existing environment); (2) social constructive (putting patient into new environment); (3) psychiatric interviews; and (4) psychoanalysis. In addition, drug therapy consisting of phenobarbital, bromides and dilantin was employed although often reduced or eliminated as the patients improved. He reports marked improvements in 67 per cent of the cases, the reduction of the number and severity of seizures varying from 30 to 100 percent in those showing improvement.

We have had five patients with convulsive seizures referred to us for study—three girls and two boys. In each case we found severe emotional disturbances.

The youngest, a very sensitive, highstrung girl of 3, whose "spells" occurred at the time the foster parents began exerting undue pressure on her to continually perform for guests, responded to an excellent foster home placement. An older girl, age 15, who developed "spells" one year previously, had not responded to ordinary treatment methods. Psychiatric interviews revealed marked inter-family tension with this youngest caught in the midst. Physical examinations including neurological and laboratory studies were negative with the exception of a congenital ichthyosis. This girl began improving in hospital during which time she was seen intensively for psychiatric interviews. Following discharge from hospital she was established in a work home where she was happy. Her seizures have ceased without medication. Our third female patient had convulsive seizures complicated by a severe diabetes. Her life history was one of continuous emotional tension arising from an unstable home environment. We were unsuccessful in this case, due largely to lack of full parental cooperation.

The first of our male patients was admitted to hospital with a history of having had convulsive seizures of one and one-half months' duration. This patient tried to impress the resident staff with his seizures by continually calling attention to those which occurred while in the hospital. Physical, neurological and laboratory studies, including the McQuarrie pitresin test, were negative. Psychologically he was of average intelligence but possessed a definite reading disability which had resulted in marked lack of school achievement. He constantly referred to himself as being "dumb". This boy was returned home with special recommendations concerning orientation of

school work. We have heard nothing from this patient since discharge from hospital.

Our fifth case was a 12-year-old boy who was labeled a dangerous epileptic by the local physician and committed to the epileptic colony at Cambridge by his local county. However, because emotional factors were suspected, he was referred to the University Hospitals for diagnostic studies. Intensive physical, neurological and laboratory studies revealed nothing definite to account for his seizures. After the first week of hospitalization none occurred while he was here. Briefly, our investigations showed that this boy was devotedly attached to his father and grandmother but had been forced to live with his mother who had been granted his custody following separation of the parents. He violently hated his mother and there are some indications that he suffered from abuses at home. Initially he was defensive, stubborn, willful, aggressive and belligerent. Intensive individual work with him resulted in improvement and he began modifying his anti-social characteristics. He was finally placed in a children's home. During his stay there we succeeded in gaining permission of the mother and the court to return him to the home of his grandmother. After a stormy period of two months, he settled down and had no seizures. Six months later his grandmother became ill; this necessitated his leaving the farm to live with his father who was employed in the city. Here, without supervision, he again encountered difficulty with occasional recurrence of his seizures. He has only lately returned to the farm.

ASTHMA

We have been interested in the possible role of emotional factors in bronchial asthma and have had the opportunity of studying six patients with this condition. In our group are four girls and two boys, ages ranging between 9 and 16. We found each one to be nervous and anxious and under definite emotional tension, precipitated in five of the cases by mothers who were over-protective. Marked parental conflict was noted in four of these cases. One boy had never been cared for by his mother, having spent all his life in hospitals or foster homes, and he often wondered why he could not live with her. None of these children easily displayed emotion by crying. Careful skin testing revealed no definite allergic sensitivities. Five of the cases were of long duration. Four patients had had severe attacks of bronchitis in early childhood preceding the asthmatic attacks. Each of these cases was stubborn and refractory to the usual methods of treatment.

At present three of the six are definitely improved and are attending school regularly; this was heretofore impossible. Of the remaining three, one is improved; two are not. In these two cases unmodifiable circumstances have prevented effective therapy.

Let us illustrate by citing one case study.

L. was a 14-year-old girl who had a long history of intractable asthma dating back to childhood when she had had severe bronchitis. Family history revealed that the paternal grandfather had asthma and the mother had eczema. Physical and laboratory examinations were negative, although many eosinophiles and polymorphonuclear cells were noted on the nasal smears. X-rays of the chest showed pulmonary emphysema. Cutaneous tests gave consistently positive reactions to housedust and cereal allergens but were not conclusive in establishing a specific form of therapy. Repeated visits to the allergy clinic were a common occurrence with the mother always exhibiting marked anxiety about her daughter.

Psychiatric interviews revealed a tense home situation. The parents were not getting along. Later we learned they had separated. The mother had restricted all her activities to her

daughter to compensate for the lack of compatibility with her husband. The daughter was "growing up" and demanding increased opportunities for recreation and pleasures away from home. The mother and daughter were caught in a conflict over the patient's choice of a vocation. She wanted to be a nurse; the mother discouraged this because she felt her daughter could not successfully compete in such strenuous training. She insisted that the patient become an art teacher.

Through our efforts the mother was aided in discovering new interests apart from her daughter. Preparation for a compromise career, occupational therapy, proved acceptable to both, and the patient was encouraged to attend a vocational high school. Participation in social activities increased. Response to lessening domination of the mother with increased freedom to determine her own program resulted in a diminishing number of attacks. These have subsequently disappeared. She no longer talks of asthma and is able to eat foods to which she was previously sensitive.

CONCLUSION

In reviewing our activities with those pediatric patients referred to the clinic it is not suggested that disturbed emotional states cause enuresis, diabetes, convulsions or asthma. At present, experimental and clinical evidence warranting such conclusions is still lacking. However, from our own experience and that of others, the impression gained is that psychogenic and emotional factors play a more important role in pediatric conditions than is commonly recognized. Furthermore,

they are of sufficient importance to justify serious consideration in diagnostic as well as therapeutic procedures in every case.

If this is true, then the physician needs to evaluate more critically the intangibles in every physician-patient relationship. The method of dealing with the patient, what is said to or about him in his presence, and more particularly, how it is said, may serve as a powerful influence to encourage or discourage him. Recognizing that there are two complimentary sides to medicine, the physical and psychical, it seems apparent that when a physician is called upon to treat a patient he cannot afford to neglect either method of approach in his management. Regardless of what his particular specialty may be, fundamentally he is treating individuals rather than diseases.

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Public Health Aspects of Premature Infant Care in Minnesota

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DURING the year 1933 there were 10,607 fewer live births in Minnesota than in 1915. This represented a fall during that period in the birth rate from 25 to 17 live births per 1,000 population. In succeeding years the number of live births has gradually increased to a rate of 18 in 1939, and there were only 4,884 fewer births than in 1915. The population has increased during the intervening years, however, and had the 1915 birth rate prevailed during 1939 there would have been approximately 19,000 more births than actually occurred. Because of a lower birth rate, fewer young people are found in the population. This factor and the increased longevity resulting from general improvement in public health have been the principal reasons for the changing age distribution of Minnesota's population shown in table I.

The aging of Minnesota's population means a less vigorous people and, from a purely social viewpoint, the saving of infant lives seems to be of considerable value.

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TABLE I.
Minnesota's Aging Population — Percentage Age-distribution of Population for Selected Census Years

	Under 15 Years	15 to 44 Years	45 Years and over
1880	40	46	14
1900	36	48	16
1920	31	48	21
1930	29	47	24

The continuous reduction of Minnesota's infant mortality during the past 25 years has compensated to some extent for the fall in the birth rate (fig. 1). During 1939 there were 1,798 deaths of infants under one year of age. The infant mortality rate for that year, 36 per 1,000 live births, is an improvement of fully 49 per cent over the rate of 70 in 1915. Had the rate of 1915 prevailed during 1939 there would have been approximately 1,700 more infant deaths than actually occurred that year. Analysis of the Minnesota infant mortality at the present time shows that 68 per cent of the deaths during the triennial period 1937-1939 occurred in the first month of life—in the so-called neonatal period (fig. 2).

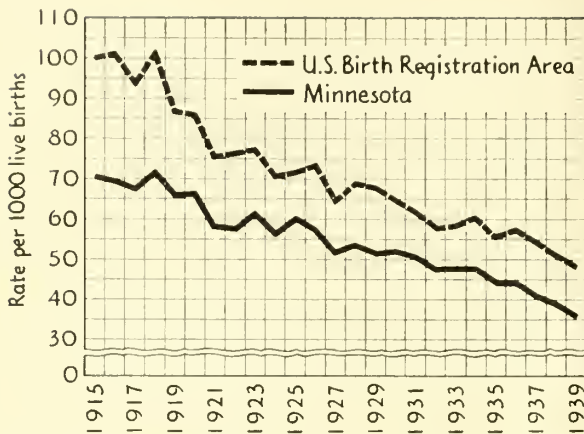


Fig. 1. Comparison of rate of deaths under 1 year of age per 1,000 live births in Minnesota with the United States Birth Registration Area.

Among the chief causes of these early deaths are found prematurity, birth injury, congenital malformations, congenital debility and diseases peculiar to early infancy. Of these, prematurity is by far the most prominent, being reported as responsible for 52 per cent (fig. 3).

Although sharing honors with the states of Connecticut and Oregon, Minnesota's 1939 infant mortality rate of 36 deaths per 1,000 live births was actually the lowest in the country. Minnesota has been a consistent leader among the states in the reduction of total infant mortality but has not attained the same eminent position for deaths among premature infants. For example, the 1938 State premature infant mortality rate of 13 per 1,000 live births placed Minnesota only fifteenth among the states. It is largely in this group of infant deaths that hope is found for future reduction of infant mortality in Minnesota. These deaths may be favorably affected in two ways: (1) by continuously raising the standards of obstetric practice and (2) through better care of the newborn infant.

OBSTETRIC FACTOR IN PREMATUREITY

The fact that Minnesota's maternal mortality rate is among the lowest in the country indicates that obstetric problems are being well handled in this state. Nevertheless, the recent medical literature emphasizes the high premature mortality associated with obstetric operative interference. Appraisal of this situation is difficult, however, because operative measures are usually undertaken in the face of abnormalities and because of danger to the mother. There is little doubt that excessive use of obstetrical anesthesia and analgesia is dangerous to the infant. Judicious conservatism in these matters may avoid many difficulties and aid the survival of the infant. More prominent factors, on which the fate of the premature infant depends, are the health of the mother during the pregnancy and the degree of the infant's immaturity at birth.

The incidence of premature birth is closely related to the health of the mother during pregnancy. Among the numerous conditions in the mother recognized as hav-

ing causal relationship are the toxemias of pregnancy, acute infections, and chronic disease, including syphilis, heart disease, tuberculosis, diabetes, nephritis and pyelitis. The toxemias of pregnancy are a more frequent cause while syphilis is not as important as in the days before routine prenatal Wassermann testing and anti-luetic therapy. Local conditions in the uterus, such as placenta previa or premature separation of the placenta, cause prematurity. Premature birth is most frequently associated with multiple pregnancy.

Factors in prenatal hygiene¹ are also believed to influence premature birth. Among these are trauma such as a fall, overwork, heavy lifting and severe emotional disturbances. The proportion of premature births is high among infants born to young mothers, among infants born at short intervals after a preceding pregnancy and among infants born to mothers employed away from home during pregnancy.

That the degree of immaturity of the infant at birth has a definite relationship to the chances of survival is well shown in the figures of table II reported by Hess² from his experience at the Sarah Morris Hospital Premature Station in Chicago. In this table the birth weight is used as the measure of fetal age.

TABLE II.
Mortality Rates Based on Weight

Weight	Survival Percentage
Less than 750 gm.	4.35
750 to 1000 gm.	17.12
1001 to 1250 gm.	40.7
1251 to 1500 gm.	53.8
1500 to 2000 gm.	76.9
2000 to 2500 gm.	87.8

Since Clifford³ has estimated the fetal weight gain at the rate of 5 to 6 ounces (150 to 180 grams) per week during the seventh and eighth lunar months and from 8 to 12 ounces (240 to 360 grams) per week in the ninth and tenth months, it is of great importance to postpone birth as long as the condition of the mother will permit. It is apparent that a few weeks of continued intra-uterine life may easily determine the survival of the individual infant and is of great importance in reducing premature mortality. This data again emphasizes the public health significance of routine prenatal medical care, the practice of which has long been advocated for the benefit of both mother and infant. Certainly the management of prematurity should begin with obstetric prophylactic measures.

CARE OF THE PREMATURE INFANT

While the prolongation of pregnancy through prenatal care is appealing as a more direct approach to the problem, under present medical knowledge the reduction of premature mortality remains largely a matter of care for these infants after birth. During recent years methods for care have been developed in large hospitals which more adequately meet the physiological handicaps of prematurely born infants. That these methods are successful is shown by Stoesser's⁴ reports of his

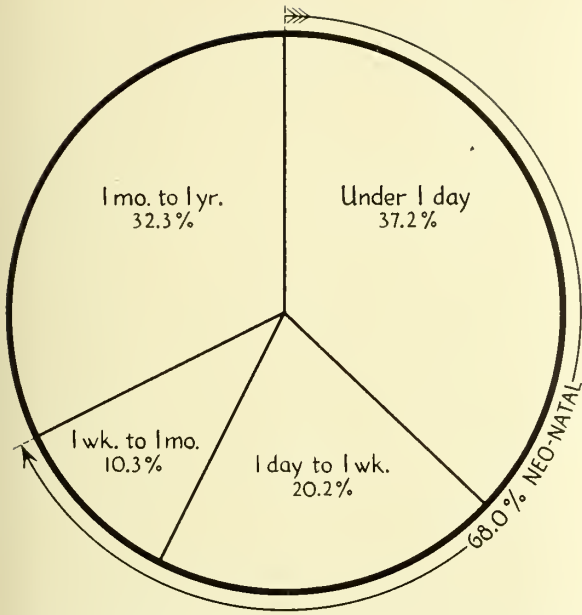


Fig. 2. Distribution by subdivisions of the first year of life of 5,699 infant deaths reported in Minnesota, 1937-1939, inclusive.

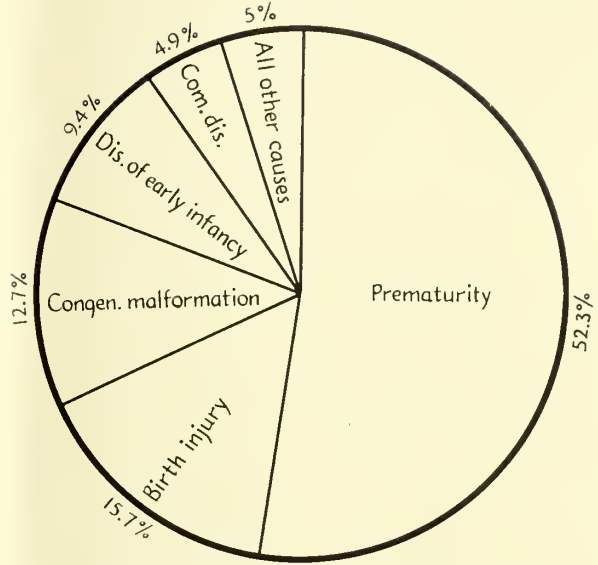


Fig. 3. Distribution by cause of death of 3,868 infants reported as dying in the first month of life in Minnesota, 1937-1939, inclusive.

experience at the Minneapolis General Hospital. At this hospital premature infant mortality was reduced from 60.8 per cent in 1930-1931 and 65.8 per cent in 1931-1932 to the low level of 13.3 per cent in 1936-1937 and 18.5 per cent in 1937-1938. A statewide application of the newer methods for care of the premature infant offers hope for future reduction of infant mortality in Minnesota. Authoritative writings on the care of the premature infant are amply available in the recent medical literature. Therefore, the effort here is to summarize this care only to emphasize significant life-saving factors and to bring out some phases of their application in Minnesota.

1. *Care begins immediately after birth.*

Since premature birth may be precipitate and frequently creates an emergency it is necessary always to be prepared for the care of the infant. The hospital is advised to keep oxygen and a heated incubator available in the delivery room. When premature birth is expected preparations should be made before delivery.

During 1939 there were 740 infant deaths reported to the Division of Birth and Death Records and Vital Statistics, Minnesota Department of Health, in which premature birth was given as the primary or contributing cause of death. The fact that 68 per cent of these deaths occurred in the first 24 hours and 83 per cent in the first 48 hours of life indicates that whatever is done for the premature infant must begin immediately.

2. *Maintenance of normal body temperature.*

The necessity for maintaining the infant's normal body temperature has long been recognized. An incubator conveniently provides the necessary warmth and provision of humidity is regarded as

useful in stabilizing the body temperature and helpful to the progress of the premature baby. These babies do not withstand chilling and at birth it is recommended they be received directly into a warmed sterile covering.

3. *Management of asphyxia and cyanosis.*

Postmortem studies⁶ have shown that anoxemia is responsible for approximately 22 per cent of premature infant deaths. Clearing the air passages of mucus and amniotic sac contents, gentle stimulation and gentle artificial respiration are accepted procedures. Oxygen is essential for the prevention and treatment of asphyxia and cyanosis.

4. *Proper feeding.*

The newer concept of feeding is one of the developments which has contributed greatly to recent success in handling premature babies. In the past the natural tendency has been to initiate feedings early and overfeed for a rapid gain in the shortest possible time. Too early feeding is recognized as a frequent cause of aspiration and overfeeding results in vomiting and abdominal distension. From these may ensue cyanosis, dyspnea, diarrhea, and respiratory infections. Undoubtedly these have been important factors in the high morbidity and mortality of premature babies during the neonatal period.

The newer concept of feeding premature babies has been aptly named "minimum feedings" at the Sarah Morris Hospital Premature Station.⁷ It involves the establishment of a "food tolerance" for each baby individually by beginning with very small feedings and increasing the amount of food gradually. Weight gain is not expected in the first

few days but after that the effort is to feed the smallest amount on which the baby will gain rather than to attempt to produce an early rapid increase in weight. This manner of feeding is of value since it avoids the consequences of overfeeding and more frequently carries the infant smoothly through the critical early weeks of life.

The value of human breast milk for feeding these infants is emphasized by all writers on the subject. Human breast milk is not only the best infant food from a nutritional viewpoint but has other admirable qualities such as cleanliness, convenience, economy, and offers considerable protection against infections. Every mother should be encouraged to establish and keep up her milk supply, unless there is the presence of some disease contraindicating breast feeding. Dietary and hygienic measures, manual expression, the breast pump, in fact, every known method should be employed to aid the mother in this regard. When breast milk is obtained from a wet nurse, the person supplying it should be Wassermann tested. Parenteral administration of fluids to supplement the milk intake, and early feeding of vitamins are also important considerations in the feeding regime.

5. *Prevention of infections.*

Provision of adequate isolation and the employment of aseptic technics for the prevention of skin, respiratory and intestinal infections are basic principles of good infant care.

6. *Minimum and gentle handling.*

The infant is disturbed as little as possible for the first 16 to 24 hours after birth. All methods of care including feeding, diapering, clothing and bathing are designed to conserve the infant's energy and provide maximum rest.

7. *Nursing care important.*

Few situations in medicine require such constant vigilance and patient attention to details as the care of a premature infant. Nursing care is necessary for maintenance of body temperature and aseptic technics, for patient and careful feeding, for watchful attention to clinical symptoms and the giving of emergency treatments. The prescribing of care is the function of the physician but he will recognize that provision of an interested and conscientious nurse is a major factor in the successful management of the premature infant.

8. *Hospital care.*

Care in a properly equipped and well managed hospital should be provided if possible. Sixty-five per cent of Minnesota's births occurred in hospitals during 1939. The preparation of Minnesota hospitals for adequate premature infant care will immediately serve a majority of infants and at the same time provide centers to which infants born in the home may be taken.

9. *Follow-up care.*

It would be poor foresight, indeed, to expend much time, effort and money to bring a premature infant through the critical neonatal period only to lose him soon after from a preventable infection. Follow-up care involves, first, preliminary teaching of the mother and preparation of the home for reception of the infant and, second, continuous medical supervision of the care, feeding and development of the infant.

The principles developed for conducting the Sarah Morris Hospital Premature Station have been applied in a Chicago city-wide plan for premature infant care. In this plan Hess⁸ emphasizes follow-up care, and the value of a field nursing service for instructing the mothers.

USE OF THE PUBLIC HEALTH NURSE

Attention has been directed to the value of nursing care and also to the need for training the mother and preparing the home for successful management of the premature infant. These matters become urgent for the baby who is entirely cared for in the home but are also significant to the welfare of a baby brought to the comparatively unorganized home from the controlled environment of the hospital. In these phases of premature infant care the public health nurse can make a significant contribution. Teaching the mother how to carry out the physician's instructions relating to prenatal hygiene and the care of the infant, the organization of the home for care of the baby, and the giving of emergency nursing care are all activities for which the public health nurse is well adapted by training and experience. The teaching of breast-expression to promote the milk supply is recognized as a nursing function. It should be emphasized that the public health nurse in working with an individual patient is directly responsible to the family physician.

Thirty-five per cent of all Minnesota infants were born at home during 1939. However, outside of the three large cities 51 per cent of births still occurred in the homes and in many rural areas the proportion approached 70 per cent. The physician who asks the employing agency for the assistance of the public health nurse will find a loyal and useful helper. Every county in Minnesota should have a public health nursing service to assist physicians in the homes with the care of the premature infant.

THE MINNESOTA PROGRAM

Since July 1939 the Division of Child Hygiene, State Department of Health, in coöperation with the Minnesota State Medical association, the Minnesota Hospital association and the Medical School of our State University, has promoted a program directed towards the improvement of care of premature infants. It is made possible by maternal and child health funds coming to the State under the provisions of the Social Security Act.

The program is in the nature of postgraduate education and its essential purpose is to aid those in our state who are directly concerned with care of these

infants. Important considerations in the planning of these activities, which are outlined below, are emphasis on practical methods for care of premature infants, the superiority of good hospital care over that which may be given in the average home, and the necessity in many hospital nurseries to plan for the care of the premature infant along with that of the normal newborn.

1. The conduct of annual postgraduate study courses for physicians in pediatrics and obstetrics.

During the past two years these courses have been presented at the Center for Continuation Study, University of Minnesota, to physicians selected by the component medical societies of the state association. These physicians attend with all expenses paid on the understanding that they will later present the material at local society and hospital staff meetings.

2. The sending of a specially trained pediatric nurse to the hospitals of the state to introduce the newer methods of care for newborn and premature infants. This nurse meets with the medical and nursing staff and presents material by lecture, demonstration and actual assistance in the hospital nursery.
3. The introduction of a consideration of premature infant care into the 1940 continuation study program for Minnesota public health nurses.

4. The distribution to physicians, nurses and hospitals of blueprint plans and specifications for an inexpensive yet practical incubator box and of authoritative medical literature on the care of the premature infant.
5. A consideration of the premature infant in the Division's long conducted maternal and child health education program for mothers. It is naturally essential in this teaching to stress the value of medical, hospital and nursing care for mothers and babies.

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Erythroblastosis Foetalis*

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ERYTHROBLASTOSIS, a term connoting the presence of foci of red blood cell formation outside of the marrow, is a characteristic pathological finding in three very dramatic episodes of the newborn period—usually referred to as hydrops foetalis, icterus gravis, and anemia neonatorum. Erythroblastemia—the presence of these immature cells in the peripheral circulation—may or may not be manifest in any given case, but is usually very striking. The close relationship of this triad of edema, icterus and anemia was emphasized by Diamond, Blackfan and Baty nine years ago in a critical analysis of twenty cases,¹ and since that time various combinations of these manifestations have been grouped together under the collective term of "erythroblastosis foetalis" or simply "erythroblastosis".

ETIOLOGIC CONSIDERATIONS

To anyone who has interested himself in a study of diseases of the newborn period, it seems quite obvious

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that there must be a common etiologic basis for these three clinical syndromes which are so closely related hematologically and pathologically. Numerous papers have appeared dealing with the nature of the causative factor,^(A) but this still remains obscure and unproven. The pathological picture, except for the edema and hemorrhagic manifestations, may be briefly summarized as a reversion to, or continuation of the fetal state of blood formation.²¹ The clinical features most frequently appear as an accentuation of "normal" or "physiologic" edema, icterus and anemia of the newborn. Although no single etiologic theory yet advanced seems to account adequately for all the various clinical manifestations of this disease entity, each one of the following have been proposed to explain this characteristic hemolytic dyscrasia of the newborn.^{28b}

1. Erythropoetic^(B). Due to a primary metabolic disturbance¹—or possibly to a dominant mutation in the germ cells of either parent¹⁸—there is an over- (A) 2,13.

growth of immature erythrocytes. Then, because of the increased fragility of these immature forms, there is excessive hemolysis, icterus, edema, anemia, and a persistence of compensatory erythroblastosis.

2. Hemolytic or "erythronoclastic"^(C). Due to a qualitative or quantitative lack of a theoretical antihemolytic substance which these infants fail to inherit from the maternal circulation, primary hemolysis results, and the other manifestations of the disease are secondary due to this uncontrolled hemolysis.
3. Antibody-antigen reaction^(D). Isoimmunization or passive sensitization of the fetus against his own red blood cells by agglutinins from the maternal circulation. In this case, the severity of the disease is related to the concentration of agglutinins passed into the fetal circulation.
4. Fetal hepatic dysfunction⁷ related to the degree of anoxemia present.

The basic etiologic theory remains entirely hypothetical, and there is no sound experimental evidence yet advanced to prove any theory proposed. All these theories are difficult to correlate with the finding that the disease occurred in both twins in only 40 per cent of the twenty-two pairs reviewed by Macklin, Lamont, and Macklin two years ago.¹⁸ Two subsequent reports^{19,20} have not altered this interesting "discrepancy".

INCIDENCE

It is as yet quite impossible to arrive at an accurate estimation of the frequency of this disease; the figures appear to depend to a great extent on the interest displayed in various clinics and hospitals.^(E) Earliest reports, when only the most severe manifestations were considered, may now be discarded as entirely misleading. Because many stillbirths are not examined pathologically,²⁷ and because many cases of severe anemia do not become apparent until the infant has completed the conventional neonatal stay in the hospital, all published data on incidence probably err on the conservative side. Estimations of frequency vary from 1:2000 births up to 1:400 births, and in a local hospital during 1940 there were eight proven, or ten presumptive cases in 1030 births—an incidence of about 8:1000. A standard pediatric textbook gives a probable incidence of about 1:1000. The disease probably accounts for about 5 per cent of the total infant mortality.²⁴

PREMONITORY SIGNS

The tendency for familial occurrence^(F) has long been recognized as an outstanding characteristic of erythroblastosis. Given a case in one infant, the odds are someplace between 50 and 80 per cent that subsequent offspring will be similarly or more severely affected. Hellman and Hertig²³ analyzed thirty-five cases, and found the average maternal age to be 30.1 years, and the average parity to be 3.1; only one infant was born of a primiparous mother in this series. There appears to be no racial predisposition,^{24,25} and no race seems exempt. Several authors have noted an unusually high incidence

of toxemias in the mothers of these infants, about a third being so affected. A poor weight-gain during pregnancy, a high incidence of hydramnios, and decreasing fetal activity have all been noted frequently. Labor is usually premature. Amber-colored amniotic fluid or golden vernix caseosa, always regarded as ominous premonitory signs, have been noted in only a small percentage of the cases, and is present in some instances when the disease does not develop at all. The placenta is usually large, heavy, and edematous; the usual fetal-placental weight-ratio of about 6:1 is altered, as in syphilis, to the neighborhood of 3:1. Hydrops can often be accurately diagnosed in utero by X-ray demonstration of the characteristic thickening and increased density of the fetal soft parts, particularly over the fetal scalp;²⁶ the diagnosis may be suspected when an unusually large placenta can be visualized by X-ray.

MANIFESTATIONS IN THE AFFECTED INFANT^(G)

The most serious of these is usually the most obvious—universal edema present at the time of birth. This may be so extreme as to cause dystocia, and all gradations are seen down to the normal minimal physiologic edema over the scalp and extremities. Jaundice may be present at the time of birth, or appear during the first forty-eight hours to a varying degree. Some cases of severe anemia may be initially masked or overshadowed by the edema or icterus, but very noticeable pallor is almost always present by the fifth day. These three foregoing signs appear in any combinations and degrees of severity in a given case, and are frequently accompanied by signs of hemorrhage. The infant usually exhibits marked lassitude and evident exhaustion. Air hunger often appears obvious when there is a sudden marked fall in the hemoglobin level of the blood. The pulse is usually extremely rapid and weak, the heart tones of poor quality; the infant appears to be "in shock". X-ray studies bear out the practically uniform finding of an enlarged heart. Whether or not hemorrhagic manifestations are present during life, these are almost always present at autopsy; this hemorrhagic tendency may or may not be on the basis of a prothrombin deficiency. Probably because of the marked lassitude, the respirations are shallow, and persistent atelectasis frequently complicates the picture. Fever is usually absent. The liver and spleen show varying degrees of enlargement, which does *not* correlate well with the amount of extramedullary hematopoiesis present. Along with the marked apathy, these infants are difficult to feed, and require special nursing attention to overcome this difficulty.

LABORATORY FINDINGS

The normal blood picture of the newborn here requires repetition. Average figures taken from the literature^{28a} indicate that on the first day of life, most infants have a hemoglobin level of about 120 per cent (Sahli), an erythrocyte count of 5.5 billion, and a leucocyte count up to 20,000 per cu. mm., 60 per cent of which are polymorphonuclear. Strong and Marks²⁹ found that it was the opinion among hematologists that there may be as many as 5000 normoblasts per cu. mm.,

(B) 1,5,7,8,11,18,22. (C) 2,3,12,22. (D) 7,14,15,16,17.

(E) 21,22,23,24.

(F) 1,2,3,5,10,11,13,21,32. (G) 1,2,3,4,5,6,7,10,11,13.

that these usually disappear by the second day, and that the presence of nucleated red cells younger than the normoblast should always be considered pathologic. Tow³ wrote, "it is claimed, and rightly so, that erythroblasts in the blood stream of the newborn infant in the proportion of from 6 to 10 per cent of the white cells are a normal finding during the first 48 hours of life, and are but a manifestation of the immaturity of the red cells." Downey³⁰ states that "in the majority of full term normal infants the nucleated red cells average 1 to 1.5 per 100 white cells during the first day of life, although there may be as many as 24 per 100 white cells. Disappearing rapidly, they are rarely seen by the fifth day."

In erythroblastosis, the anemia is of the hyperchromic macrocytic type; poikilocytosis and anisocytosis are usually extreme. Immature red cells are usually present beyond the usual limits set for the newborn period. The blood smears frequently bear a striking resemblance to those seen in the crisis of pernicious anemia.⁸ A marked reticulocytosis, polychromasia, and erythroblastemia probably indicate that the marrow has not been too severely damaged by the disease, and therefore can be taken as a valuable prognostic sign. It is our experience, that when erythroblastemia is absent, the infant will be far more resistant to therapy and will require many more transfusions before the disease is arrested. Marrows so far studied after sternal aspiration have been uniformly hyperplastic in all cases. The urine usually contains an excess of urobilin, urobilinogen, and even bilirubin, and the stool may or may not be acholic. The Van den Bergh reaction is usually direct in the early stages, then may be either direct or indirect later—i. e., the jaundice is on a combined obstructive and retentive basis in most cases. The changes in bile excretion are extremely variable, and there is very little correlation between the severity of the icterus and the degree of anemia in any case. The platelets may be slightly depressed, and there is usually a rather striking leucocytosis, even excluding the nucleated red cells; eosinophilia is regarded as a good prognostic sign. Fragility tests usually show a borderline decrease in resistance of the red cells, due probably to the well recognized increased fragility of immature cells. Nitrogen retention was noted in three cases studied by Weinberg³¹ but we have not been able to confirm these results.

PROGNOSIS IN ERYTHROBLASTOSIS^(H)

With fully developed hydrops, the majority of cases are stillborn prematurely, and even if the infant is born alive, he usually succumbs within a few hours. Icterus gravis has proved fatal in from 50 to 80 per cent of the cases reported²⁹—depending to a large extent on early recognition and treatment of the condition. Figures are not available to determine the outlook in anemia neonatorum, but as this manifestation appears most frequently in those infants who have survived the milder degrees of icterus gravis, it is probably good, barring intercurrent infections and provided the anemia is corrected early. As any combination of the three outstanding features may occur in any case, one is probably justifi-

fied in assuming a case fatality rate for the disease entity of greater than 50 per cent. We believe that with early recognition and intensive treatment this figure can be improved appreciably.

Kernicterus^(I) is the term which has been used to designate the unfortunate syndrome of spasticity and mental retardation which occasionally appears later in some infants who recover from the initial erythroblastosis. It seems reasonable to assume that this degenerative process is not due simply to icteric staining per se, as previously supposed, but rather that this staining is purely incidental to the excess circulating bilirubin, and is accomplished simply by an "intravital technique" affecting cerebral centers injured by earlier anoxia or birth trauma.

DIFFERENTIAL DIAGNOSIS

Syphilis, sepsis, and other severe systemic infections are the conditions most apt to be confusing at the onset of symptoms, and should always be excluded in any case when erythroblastosis is suspected; usually the history, associated physical findings, serology, and blood cultures accomplish this differential quite readily. Physiologic icterus neonatorum makes its appearance later, on the third to the fifth day, is not so intense, and the infant appears otherwise well. The jaundice in congenital atresia of the bile ducts appears even later, increases slowly without other alarming symptoms until hemorrhagic tendencies appear, and is of the obstructive type. Hemorrhagic disease of the newborn (hypoprothrombinemia) may be confusing when associated with marked physiologic icterus, but is differentiated by the course of the disease and the response to specific therapy.

PROPHYLAXIS^{4,35,36}

Although there is no uniformly successful procedure, it has been suggested that liver extract be given parenterally during the course of pregnancy when the disease can be expected. Adams and Cochrane recently employed such a plan with success, though Abt suggested that liver therapy was successful only by coincidence. We believe that the practice deserves further trial. Macklin²⁷ suggested that labor be induced early when the disease is suspected, in an attempt at earlier arrest of the process with transfusions. Caesarean section may be indicated in selected cases for the same reason.

TREATMENT^(J)

Early and adequate transfusions are the most reasonable and successful measures. It is often necessary to transfuse these babies several times daily, and there are several cases on record in which the total amount of blood given intravenously has exceeded the theoretical blood volume of the newborn. No more than 20 cc. of blood should be given per kilogram of body weight; this amount corresponds roughly to a transfusion of from 1200 to 1500 cc. in the average adult. As the blood group is already established in about 11 per cent of newborn infants,¹⁴ grouping and cross-matching should be done, and of course the presence of any communicable disease in the donor should be excluded. On

(H) 2,3,5,12,23,24,29. (I) 28,32,33,34.
(J) 2,3,5,6,9,11,12,19,21,23,24,27.

the theory of a lacking antihemolytic factor, adult serum has been given intramuscularly with apparent success. Hampson¹² reported recovery in seventeen of eighteen infants with icterus gravis treated in this way; he advocated the injection of 10 cc. of serum as soon as the diagnosis was made, followed by 5 to 15 cc. every other day to a total amount of 30 to 60 cc., or until the serum bilirubin was less than one part in 150,000. Parsons stated that this form of therapy would have doubtful value if the administration of serum were delayed beyond the first day. Cooley³⁷ mentioned the successful arrest of the hemolytic process and the rapid clearing of erythroblastemia after splenectomy in one patient who later eviscerated and died of peritonitis; he advocated early splenectomy in cases of icterus gravis with marked enlargement of the spleen.

Further symptomatic care requires strict attention to the avoidance of exposure and heat loss; a "premature routine" is usually advisable. Vitamin K should be administered parenterally to all cases, preferably with prothrombin-time control.

In our opinion, transfusion of whole blood is the best means of tiding these infants over the early fulminating hemolytic stages of the disease.

SUMMARY

Erythroblastosis, including hydrops *fœtalis*, icterus gravis, and anemia neonatorum, is *not* a rare disease. It has a characteristic familial occurrence, appears most frequently in the third or fourth pregnancy, and is highly fatal, accounting for an appreciable part of the total infant mortality. Erythroblastemia and hemorrhagic manifestations are usually present, but not necessarily so. The disease can usually be anticipated from a fairly typical sequence of premonitory signs. Birth is usually premature, the placenta is large and exhibits a characteristic pathology. A diagnosis can often be confirmed by X-ray while the infant is still in utero.

In those instances where the diagnosis is not apparent at the time of birth, symptoms usually become manifest during the first forty-eight hours of life. Anemia is frequently masked by the intensity of the edema or icterus. Hemorrhagic tendencies are commonly seen, enlargement of the liver and spleen are variable features, and associated cardiac enlargement, persistent atelectasis, thermal instability, and the appearance of shock are usually present.

"Kernicterus" is the most serious complication occurring in those infants who survive the early stages of the disease, and this is probably related to cerebral anoxia rather than the icterus per se.

Congenital syphilis, sepsis, congenital atresia of the bile ducts, hemorrhagic disease of the newborn, and severe degrees of physiologic jaundice are included in the differential diagnosis.

Prophylactic procedures deserve a more extensive trial.

Early and adequate transfusions of whole blood intravenously constitute the most satisfactory therapeutic measures. With early recognition of the condition, and intensive treatment to control the excessive hemolysis and

resulting anemia, we believe that the high case-fatality rate can be appreciably lowered.

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Use of Fluids in Pediatrics*

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BECAUSE of the many important roles played by water, stability of the fluid matrix of the body is now recognized as the first prerequisite to sound health. This stability or "steady state" of the body is maintained normally by many factors. The most important of these is the joint action of the autonomic nervous system and the various hormones or "chemical regulators" which control the circulatory, respiratory, secretory and excretory organs. In order to obtain a rational therapeutic approach to the many clinical problems involving disturbances in water and mineral metabolism, it is necessary to use constantly our knowledge of the physiological mechanisms concerned in this control, and of the physico-chemical forces immediately responsible for the translocation of water and solutes within the body. This problem is of particular importance in the field of pediatrics because of the greater susceptibility of infants and children to the deleterious effects of changes in the volume and composition of the body water, which are so commonly associated with states of diarrhea, vomiting, fever, and infection. This in part may be explained by the greater per cent of water in the body of infants and children as compared with adults.

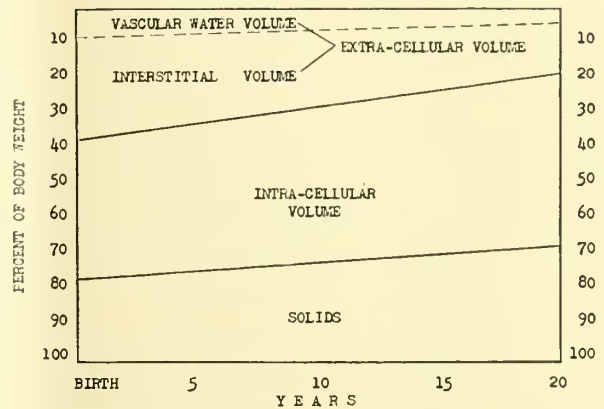
Not only is the relative per cent of body water greater in the infant than in the older child or adult, but also the extra-cellular fluid volume has a greater value at birth than it does in later life. The progressive changes with increasing age are a decrease in the total body water in relation to weight, an increase in the intra-cellular water in relation to weight and a decrease in the extra-cellular water in relation to weight. This knowledge is of extreme importance when quantitative restoration of fluid is necessary inasmuch as during the dehydration, the per cent of body weight lost as water may be greater, the younger the child. The amount of fluid to be restored in dehydration must also be proportionately evaluated with respect to age of the child because of the relatively greater fluid loss that can occur.

From a practical point of view, it is convenient to consider the water content of the body as divided into several compartments. These are distinguished not only by their situations within or outside of the body cells, or closed vessels, but by their composition as well.

The subdivision of the extra-cellular compartment into the vascular and interstitial compartments is justified by virtue of the fact that the capillary walls, while freely permeable to all crystalloids and inorganic ions, are relatively impermeable to the plasma colloids; that is, protein and lipids. The interstitial fluid outside of the vascular system is, therefore, an ultra filtrate of

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FIG. 1
Changes in the Volumes of the Fluid Compartments of the Body with Increasing Age of the Child



blood plasma. The volume of this compartment fluctuates freely in response to the quantity of fluid ingested or lost from the body and so serves as a buffer reservoir to preserve the relative constancy in the volume of the blood on the one hand and the intra-cellular compartment on the other. Cannon compares it to a swamp which may be drained during periods of drought and inundated during periods of flood.

The factors regulating the exchange of water between the intracellular and extracellular compartments have not been extensively studied, but certain facts are known which are of utmost importance to the organism. The one force which is universally active in the exchange of water and electrolytes across the membranes separating these compartments is the osmotic pressure. In keeping with Donnan's equation, osmotic equilibria between the fluids on the two sides of interposed membranes are maintained by constant transfer of water from the side of lower to the side of higher osmotic pressure as changes in the composition of fluids require. These alterations in the fluid composition are continuously occurring as a result of metabolic changes within the cells or as a result of absorption or excretion of various solutes. Thus the total osmolar concentration tends to be more or less uniform throughout the body fluids, in spite of the restraining membranes which prevent free diffusion of colloids and at some points, inorganic bases as well.

However, for an accurate understanding of these mechanisms of fluid exchange, one must have constantly in mind not only the space relationships of these compartments, but also the types of ions which occupy these spaces and their concentrations. These differences in content, as has been mentioned, are due to an inherent

FIG. 2
Electrolyte Composition of Blood Plasma, Interstitial
Fluid and Muscle Fluid

	Blood Plasma	Interstitial Fluid (milliequivalents per liter)	Muscle Fluid
BASE			
Na	142	145	—
K	5	4	120
Ca	5	4	8
Mg	3	2	27
Total	155	155	155
ACID			
HCO ₃	27	24	24
Cl	103	119	5
HPO ₄	2	2	100
SO ₄	1	1	4
Organic	6	6	—
Protein	16	3	22
Total	155	155	155

ability of the separating membranes to discriminate against certain electrolytes. Thus the plasma water and the interstitial fluid contain chiefly sodium and chloride, whereas the base of the cellular water (muscle) is chiefly potassium.

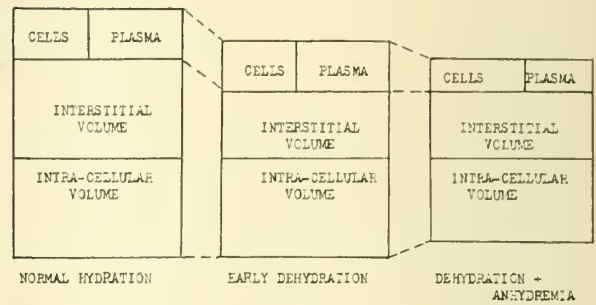
Under the normal physiologic processes the concentration of these substances are held with absolute integrity, even though considerable changes in the volume relationships may occur. The volume relationships of the compartments have been said to be dependent on the concentration of sodium. Peters states that the concentration of sodium is more closely guarded than is the volume of water. There is a small amount of reserve base which can be readily called upon during periods of stress. This is soon depleted and thus not only the total concentration of electrolytes, or the total volume of fluid may change, but also the relative amounts of acid radicals as compared with basic radicals may change and a condition of alkalosis or acidosis may occur. It is during these states that emergent and proper therapeutics are necessary for the restoration of metabolic integrity of tissues.

DEHYDRATION

Physiology of Dehydration. The physiologic effect of dehydration is initially a loss of weight due to diminution of the interstitial volume, which contributes its water to the vascular and probably intra-cellular compartments in an attempt to maintain the circulating volume and adequate hydration of cells. This loss is chiefly water, sodium and chloride; and the dehydration does not reflect itself in significant changes in the circulatory fluid. When the dehydration is more extensive, tissue breakdown occurs in the effort to provide water for the maintenance of a normal volume of circulating fluid. Fat and carbohydrate are first drawn upon for this purpose and later protein. There is a disturbance in the acid-base balance usually toward the acid side. Anhydremia is then present and due to decreased circulatory flow, metabolite retention occurs. Ketosis may exist early, dependent upon the degree of malnutrition.

Because the interstitial space is the reservoir for supply of fluid to the plasma, determination of the hemo-

FIG. 3
Schematic Representation of the Volume Changes
in Dehydration



globin, serum protein, hematocrit or plasma volume reflect primarily the changes in the circulating volume of fluid and not in the degree of dehydration of the interstitial space. Fig. 3 demonstrates diagrammatically the initial decrease in the interstitial space without change in the volume of red blood cells. Later when the interstitial space is exhausted, the circulating volume decrease is reflected by change in the hematocrit.

FEVER AND INFECTIONS

The relationship of states of hydration to infections, quite apart from that involved in heat loss by vaporization of water during fever, is very important. Barbour and Underhill have shown that the blood tends to become concentrated early in the course of febrile illness. Later the volume of blood is increased (hydremlia). This effect is due in the main to the shift of water from the tissues to the vessels, though there is some evidence that the body's total content of water is increased, i. e., water retention occurs. During the course of fever the urine volume is markedly reduced, but the water excretion is increased above normal with the fall in temperature.

Quite characteristically the onset of a febrile illness in small children and infants is accompanied by vomiting or followed by diarrhea. One must not lose sight of the fact that even though experimental evidence suggests water retention with febrile illness, any loss of acid or alkaline radicals is prone to precipitate some degree of alkalosis or acidosis and thus a true dehydration on the basis of loss of electrolytes occurs. Persistent fever in itself may be increasing the amount of water lost through the skin and lungs be an important factor in the production of dehydration. As a rule a number of factors are responsible for the development of dehydration and acidosis in severe acute infections, the most important of which are: (1) toxemia leading to tissue injury and altered metabolism, and particularly to liver damage with resultant ketosis; (2) dehydration and oliguria from increased vaporization of water from lungs and skin, diminished fluid intake, or vomiting and diarrhea; (3) circulatory failure; (4) starvation ketosis.

Clinical Picture of Dehydration. While it is not possible to measure the total body water or the extra-cellular volume of fluid in each child that presents the picture of

dehydration, knowledge of the facts previously mentioned and an accurate clinical evaluation of the signs and symptoms of dehydration will afford a practical means of evaluation. In the absence of shock-like states, simple early dehydration is characterized by excessive thirst, dryness of the mouth, tongue and skin. The palms of the hands, soles of the feet, the skin of the axilla, groin, and neck region are also dry to touch and have lost their usually moist velvety texture. Restlessness, irritability, tossing of the head from side to side, and constant crying may be present. The urine volume is decreased and the frequency of voiding is diminished. As the condition becomes increasingly severe, the child becomes apathetic, vomits and refuses offered water. Ketosis, recognized by the fruity odor of the breath, is present. The skin color is ashen grey, dry to the touch, and has lost its turgor, so that it may be pinched up in ridges which slowly flatten out when released. Oliguria is present. The fontanelle in infants is depressed and the eyes have a sunken appearance. The child may utter occasionally a sharp, high pitched cry and draw the legs up as if in pain. Meningeal signs may also be present. This stage of dehydration is approaching that of dehydration with anhydremia, and a shock-like state with circulatory collapse may occur. Here, maximum sacrifice of body fluid has been made and the circulating volume is so reduced that anuria may exist.

The clinical picture of dehydration is variable and is dependent upon many factors. The degree of malnutrition, presence of acidosis or alkalosis, presence of toxemia and high fever all modify the estimation of the degree of water loss that has occurred. It is important to remember that the younger the child the greater may be his loss of water when interpreted in per cent of body weight.

ACIDOSIS AND ALKALOSIS

While a dehydration of the body can occasionally occur without the presence of clinical alkalosis or acidosis, the causes of dehydration in infants and children are usually those which tend to produce some degree of disturbance in the acid-base equilibrium of the body.

From the preceding discussion, it is evident that stability of the fluid matrix of the body is dependent upon constancy of the concentration of the substances in solution in this volume of fluid. Of further importance is, of course, the relationship of the acid and base portions of these substances. Any change of one factor (acid) over the other (base) results in a compensatory mechanism, by the respiratory functions in an attempt to maintain this stability of the hydrogen ion concentration. When the condition progresses and the respiratory mechanism is inadequate to compensate for the defect, the kidney alone attempts by its selective function to maintain compensation. Disturbances in the acid-base balance are initially manifest by a change in the carbon dioxide combining power of the plasma. A change of the plasma bicarbonate is not to be regarded as a plasma defect, but as an important adjustment in the defense of a reaction made necessary by an underlying distur-

FIG. 4
Clinical Classification of Cases of Acidosis
and Alkalosis*

ACIDOSIS	
A.	Metabolic (acid accumulation or alkali loss)
1.	Diarrhea and vomiting
a.	Nonspecific diarrhea
b.	Bacillary dysentery
c.	Intestinal obstruction and fistula
2.	Diabetes mellitus
3.	Nephritis
a.	Acute hemorrhagic (glomerular)
b.	Acute suppurative ("pyelitis") and acute toxic
c.	Chronic with renal destruction
B.	Respiratory (CO ₂ excess)
1.	Exhaustion
2.	Paralysis of respiratory muscles
3.	Emphysema
4.	Toxins
5.	Severe acute infection
a.	Pneumonia
b.	Sepsis
6.	Miscellaneous
a.	Nondiabetic ketosis
b.	Convulsions
c.	Congenital heart disease
d.	Rheumatic heart disease
e.	Acid administration
f.	Exercise
g.	Dehydration
ALKALOSIS	
A.	Metabolic (alkali accumulation or acid loss)
1.	Obstructive vomiting
a.	Pyloric stenosis
b.	Intestinal obstruction and fistula
2.	Non-obstructive vomiting
3.	Alkali administration
4.	Miscellaneous
B.	Respiratory (CO ₂ deficit)
1.	Encephalitis
2.	Hysteria
3.	Certain respiratory stimulants
4.	O ₂ lack

*After Hartman: Brenneman's "Practice of Pediatrics," Vol. I.

ance of the electrolyte structure. Large changes in the plasma bicarbonate will obviously alter the normal free carbonic acid : bicarbonate ratio and cause extensive change in plasma pH unless the respiratory mechanism accomplishes an accurately corresponding change in the concentration of free carbonic acid.

These changes in the free carbonic acid : bicarbonate ratio are most easily detected for clinical purposes by determination of the carbon dioxide combining power of the blood (Van Slyke). A decrease from the normal value of 55 to 60 volumes per cent indicates acidosis and an increase indicates alkalosis. The various disease conditions which may cause distortions of the normal electrolyte pattern of the plasma and thus make necessary compensating changes in the bicarbonate concentration have been outlined by Hartman (fig. 4).

Of these numerous conditions the three most common causes seen in infants and children are disturbances of the gastro-intestinal function, renal disease and ketosis. Disturbances of the gastro-intestinal function are of prime importance as a cause of acidosis and alkalosis in infants. Because of the relatively greater amount of acid in relation to base in the secretion of the upper gastro-intestinal tract, loss of these secretions by vomiting or duodenal drainage will produce an alkalosis. Because of the relatively greater proportion of basic radicals to acid radicals in the secretion of the lower portion of the gastro-intestinal tract, loss of fluid in this

manner, such as in diarrhea, produces acidosis. In renal disease the faulty excretion of the acid products of nitrogen metabolism allows their accumulation within the body fluids and thus produces acidosis. Ketosis occurs when the various conditions which lower the level of carbohydrate metabolism below the value required to cover the metabolism of the fatty acids are present. This makes necessary the transport of incompletely oxidized fatty acids en route for removal in the urine. An additional and abnormal factor must, therefore, be made place for in the electrolyte structure of the plasma and acidosis when ketosis occurs.

From our knowledge of the composition of the gastric intestinal secretions, it can be seen that accurate history is of prime importance. When the picture of vomiting is predominant, alkalosis will be suggested, and when diarrhea is outstanding, acidosis will occur. The presence of both tends to offset the effect of each other, but acidosis usually predominates inasmuch as there is also metabolic acidosis (ketosis) present with the dehydration and inanition.

Symptoms of Alkalosis: In alkalosis there are usually enough important clinical symptoms which warrant taking of blood sample for CO_2 combining power. Respiration is affected in such a way that CO_2 tends to accumulate in the blood and prevent the decrease in H^+ ion concentration (rise in pH), which would otherwise follow upon the increase in bicarbonate. This compensatory breathing usually takes the form of shallow slow respiration with prolonged periods of apnea, ordinarily associated with Cheyne-Stokes respiration. It is at times so shallow that it is difficult to determine if respiration is present. These infants are usually disturbed by pain and hunger and crying may be common. Tetany may be present.

In spite of the prolonged apnea, marked cyanosis is rare. This is perhaps explained by the greater tendency for oxyhemoglobin to retain its oxygen as a result of increased alkalinity. The urine is concentrated, acid in reaction and contains a large amount of ammonia. Chloride is absent.

Symptoms of Acidosis: As in alkalosis, there are usually enough clinical findings in acidosis to warrant its suspicion and further investigation. The diagnosis is established with certainty only by the finding of a lowered serum carbon dioxide combining power.

The type of respiration is perhaps of most importance. In severe cases this is usually quite noticeably of the air-hunger type: deep, rapid and pauseless. In weak, especially in premature or moribund infants, however, such air hunger may be absent because of respiratory failure. Of almost equal importance to respiration is the appearance of the skin. Because of dehydration, the skin is dry, inelastic and not uncommonly leathery. Its color tends to be grey because of constriction of peripheral capillaries and poor circulation. Some degree of stupor is present. Urine is concentrated and strongly acid, and usually contains albumin and casts. Ketosis may exist and the odor detected in the breath. The urine is not characteristic.

THERAPY

Dehydration: A severe case of dehydration is an acute medical emergency. One should not temporize when the symptoms of dehydration, acidosis or alkalosis are present.

Whatever the cause of dehydration, one is always met with the problem of determining the severity of the dehydration and what volume and type of fluid should be given to rehydrate the patient without producing cardiac or respiratory embarrassment. This is of prime importance particularly if emergent surgical procedures are contemplated. This judgment depends at present upon numerous things which are difficult to measure. These are: the degree of toxemia, severity of the infection, the degree of impairment of kidney function, cardiac function, presence of shock, and the degree of acidosis or alkalosis present.

Determinations of the hemoglobin, hematocrit and serum protein manifest increases only when the interstitial fluid volume has been greatly reduced and a loss of water is now occurring from the circulating fluid. Vascular shock, on the other hand, is associated with increases in these blood elements due to transudation of water out of the vessels and into the interstitial space. Because the infant has a greater per cent of water in the body and, also, because there is a relatively larger volume of extra-cellular fluid, the per cent of body weight lost as water can, in severe dehydration, be as great as 25 per cent of the body weight. The older child and adult, however, will be severely dehydrated when an amount of fluid equal to 10 per cent of the body weight has been lost.

The volumes of fluid required to hydrate infants and children on the pediatric wards of the University Hospital (fig. 5) will serve as a practical guide to the immediate treatment of dehydration. For the infant under

FIG. 5
Approximate Volumes of Fluid Required to Restore a Dehydrated Child to a Normal State of Hydration

Age (years)	Weight (kgm.)	Moderate Dehydration	Severe Dehydration
Birth to 1	4 to 10	300 to 700	600 to 1000
1 to 3	10 to 14	700 to 1000	1000 to 1300
3 to 6	14 to 20	1000 to 1300	1300 to 1800
6 to 10	20 to 33	1300 to 1700	1800 to 3000
10 to 15	33 to 50	1700 to 2200	3000 to 5000

3 years of age with the symptoms of moderate dehydration, approximately 70 to 100 cc. per kg. of body weight is required to hydrate the body. Above the age of 3, approximately 40 to 70 cc. of fluid per kg. of body weight is required. When severe dehydration is present, the infant under 3 years of age may require 100 to 125 cc. of fluid per kg. of body weight. Over the age of 3, 70 to 100 cc. per kg. of body weight will generally suffice. These values are only approximations and achievement of a satisfactory state of hydration must be determined clinically. It is usually safe to give one-half of this volume of fluid intravenously and the remainder subcutaneously.

The rates of intravenous injection of these volumes of fluid for the various degrees of dehydration should not exceed the following:

Dehydrated	10 to 15 cc. per min.
Dehilitated, toxic or febrile	5 cc. per minute
Incipient shock	10 to 20 cc. per min.

In only exceptional circumstances should the volume of fluid given at this rate exceed one-half of the calculated volume for the weight of the child. If continuous intravenous therapy is necessary subsequent to hydration, the rate of injection should not exceed 3 to 6 cc. per kg. per hour. The remainder of the calculated volume of fluid necessary to hydrate the infant or child can usually be given subcutaneously at a rate of 60 to 80 cc. per kg. of body weight per 24 hours without distending the skin markedly.

Choice of Fluid to be Given: For simple dehydration, unassociated with alkalosis or acidosis, 0.9 per cent NaCl or Ringer lactate solution are fluids of choice. The use of a 5 to 6 per cent solution of glucose with the saline solution is always advisable because of a certain degree of ketosis and starvation that exists with dehydration. When the degree of dehydration has been so severe that anuria is present, due to kidney failure, and the development of an extrarenal uremia as indicated by the elevated blood urea nitrogen, the administration of these volumes of fluid may be followed by edema due to incomplete return of kidney function. Edema may also be due to the low plasma protein incident to long standing starvation so that when fluid is given and the plasma protein is thus further decreased the colloid osmotic pressure of the plasma is not adequate for the re-establishment of kidney function. Under these circumstances a small intravenous blood transfusion of whole blood or plasma given after the administration of fluid will restore the colloid osmotic pressure and circulating fluid volume, thus providing sufficient fluid for excretion by the kidney. A transfusion of whole blood given to the severely dehydrated infant before any fluid restoration has been attempted will increase the degree of anhydremia. The water of the transfused blood will go immediately out of the circulating volume of fluid into the depleted interstitial spaces, leaving protein and red blood cells in the circulation, thus increasing the viscosity of the already anhydremic blood.

Acidosis and Alkalosis: Mild acidosis or alkalosis, associated with dehydration, can be satisfactorily treated usually by restoration and maintenance of the body fluids with NaCl solution or Ringer lactate solution¹ combined with glucose solution. Restoration of the body fluid to normal with these substances allows the respiratory and kidney mechanisms to function properly and thus restores the acid-base relationship of the electrolyte pattern to normal. These processes are relatively slow, requiring 24 to 48 hours or longer for complete adjustment to occur.

¹ A Ringer lactate solution is available, which after dilution provides a lactate concentration of M/40. It also furnishes potassium, calcium and magnesium, in addition to sodium and chloride. (A modified bicarbonate-Ringer solution is also available commercially in sterile, sealed ampules. When properly diluted with sterile water, this provides a bicarbonate concentration of M/40.)

Acidosis: When the acidosis is severe, as determined by the low carbon dioxide combining power, one-sixth molar racemic sodium lactate² or sodium bicarbonate solution, 1.5 per cent³ are the repair solutions of choice. Racemic sodium lactate solution is able to neutralize an acidosis by virtue of the fact that the body is able to oxidize the lactate radical, permitting release of the base. This solution can be used successfully in all types of acidosis except that associated with severe cardiac disease with cyanosis. When acidosis due to other causes is associated with severe toxemia or depressed metabolic functions, the body is unable to oxidize the sodium lactate and thus it is incompletely effective as a neutralizing agent. Under these circumstances sodium bicarbonate may be of distinct value. The amounts of these fluids to be given can be calculated from the carbon dioxide combining power by use of the following formula:

$$\text{Wt. in lb.} \times (55 - \text{CO}_2 \text{ vol. } \%) =$$

No. cc. 1/6 molar Na lactate required

No. cc. 1/6 molar NaHCO₃ (1.5%) required
to raise the CO₂ combining power to 55 vol. %.

When racemic sodium lactate solution is used, one-half of the volume is given intravenously and the remainder subcutaneously. A carbon dioxide combining power determination is again made in six hours. When sodium bicarbonate is used, one-half of this solution is given intravenously or subcutaneously and the carbon dioxide combining power determined before the remainder is given. If the carbon dioxide combining power is not known, the following formulas may be used:

1. 12 cc. 1/6 molar Na lactate per lb. body weight will usually increase the CO₂ combining power 15 vol. %.
2. 0.0118 gm. NaHCO₃ per lb. body weight will raise the CO₂ combining power 1.0 vol. %.

If the volume of specific fluid required for the treatment of acidosis is insufficient to meet the estimated volume necessary for complete rehydration, Hartman's Ringer solution or 0.9 per cent NaCl solution in 5 per cent glucose must be given to satisfy the total requirement.

Diabetic acidosis is treated in essentially the same manner except for the requirement of insulin. The customary routine for the treatment of diabetic acidosis is as follows: Two units of insulin per kg. of body weight (1/2 intravenously and 1/2 subcutaneously) is given. Application of the formulas for the treatment of acidosis in general will provide the amount of 1/6 molar Na lactate or NaHCO₃ required. Ringer lactate or NaCl is then given until approximately 100 cc. per kg. body weight has been injected. In six hours, 0.5 units of insulin per kg. of body weight is given if the blood sugar remains elevated. Subsequent doses of insulin and glucose depend upon the urine and blood sugar. Satisfactory restoration of the acid-base equilibrium can be

² Molar sodium lactate in sterile, sealed ampules is available commercially; this may be diluted with sterile water to one-sixth molar concentration. A one-sixth molar solution ready for injection is also available.

³ A solution of NaHCO₃, containing 1.5 gm., is available commercially. This diluted to 1.5 per cent provides an approximately one-sixth molar solution.

accomplished by this method usually when six to twelve hours have passed after institution of treatment.

Alkalosis: In the treatment of alkalosis two objectives are to be obtained. Because tetany may be present, measures which would relieve or prevent its recurrence must be instituted. This is best done by the administration of CaCl_2 intravenously; 0.25 cc. per kg. body weight in a 5 per cent solution will usually suffice. Breathing of 30 per cent CO_2 and O_2 may be of value. Attention must then be directed to the restoration of the bicarbonate values and the electrolyte balance of the body fluids. For this purpose two methods may be used: A direct method consisting of the injection of HCl intravenously may sometimes be of live-saving value. However, its use is not without danger and accurate observation of the serum carbon dioxide combining power is necessary during the course of treatment. Alkalosis may also be treated in an indirect manner by the use of Ringer, Ringer lactate, or NaCl solutions for a period of 48 hours or longer. Success is dependent upon the ability of the kidney to selectively excrete the excess base, which was injected as chloride, as bicarbonate. After adjustment, further administration of saline is attended by the excretion of chloride in the urine. Since this indirect method for relief of alkalosis depends on selective renal activity, it is obvious that it will be ineffectual, if, for any reason, secretion of urine is interfered with. In this case, edema usually results and no significant change in the degree of alkalosis will occur. The blood urea nitrogen is elevated and uremia develops. Transfusions should be given to elevate the serum protein in the hope that kidney function may improve.

The above procedures are designed primarily for use in the hospital where proper facilities are available for intravenous and subcutaneous therapy. In the home, for the less severe states of dehydration, acidosis or alkalosis, the intraperitoneal method must be used. All of the solutions mentioned can be given by this method satisfactorily. When distention is present, the intraperitoneal method should be avoided. When severe states of dehydration exist, the child must be hospitalized as temporization with the home treatment will not be adequate.

When the dehydration with its associated acidosis or alkalosis has been satisfactorily treated and the normal volume and electrolyte concentration of body fluids established, attention must be directed to the subsequent fluid requirements of the child. Fig. 6 of the average water requirement of infants and children will serve as a practical guide. Persistence of the mechanism responsible for the production of dehydration, acidosis or alkalosis, will, of course, increase the subsequent fluid requirement greatly.

CONCLUSIONS

Only by knowledge of those conditions which tend to produce dehydration in infants and children and early

FIG. 6
Range of Average Water Requirement of Children at Different Ages Under Ordinary Conditions

Age	Average Body Weight in Kilos	Total Water in 24 Hours	Water per Kilo Body Weight in 24 Hours
3 days	3.0	240 to 300	80 to 100
10 days	3.2	400 to 480	125 to 150
3 months	5.4	750 to 864	140 to 160
6 months	7.3	950 to 1130	130 to 155
9 months	8.6	1075 to 1240	125 to 145
1 year	9.5	1140 to 1300	120 to 135
2 years	11.8	1350 to 1475	115 to 125
4 years	16.2	1600 to 1800	100 to 110
6 years	20.0	1800 to 2000	90 to 100
10 years	28.7	2000 to 2440	70 to 85
14 years	45.0	2250 to 2700	50 to 60
18 years	54.0	2160 to 2700	40 to 50

recognition of the state of dehydration can adequate prophylactic measures be instituted in order to prevent the serious metabolic disorders that follow loss of fluid from the body. The successful treatment of dehydration with alkalosis or acidosis demands *quantitative* knowledge of the extent of the disorder, and thus quantitative replacement of specific fluids necessary to restore the body water to normal relationship of volume and composition. This treatment should be an emergency and should be continued as long as those factors which entered into the production of the disorder exist.

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Pediatrician and Orthodontist

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SELDOM in the world of professional service is there presented a more favorable opportunity for coöperation between the members of two specialties than when the orthodontist and pediatrician can work together for a child suffering from so-called "crooked teeth" or malocclusion. By malocclusion I mean any lack of normal arrangement of the teeth or relation of the jaws which impairs their function or pleasing appearance.

Malocclusion can be classified under three general headings:

1. Neutroclusion, in which the upper and lower molar teeth "bite" (i. e., mesh) in their normal relation but the jaw structures are so arrested in their growth and development that the teeth are crowded, crooked, rotated or overlapped.
2. Distocclusion, in which the mandible is underdeveloped and short (biting back of its normal position). The upper front teeth may either protrude (making normal closing of the lips impossible) or the upper front teeth may have dropped back to rest against the retruded lower teeth.
3. Mesioclusion, in which the growth of the maxillary bone is inadequate and that of the mandible often excessive so the lower teeth protrude in front of the upper teeth.

Both mesioclusion and distocclusion are usually bilateral but may be observed to occur on one side of the jaws only.

A great deal of the etiology of malocclusion is obscure. Many things that are capable of interference with the normal development of the teeth and jaws are acute and temporary but once the complicated process of dental development has been interfered with, complete recovery, without orthodontic treatment, is impossible and the growth events following the interference are disturbed. Thus the orthodontist or pediatrician observing a child with a malocclusion sees the results of causative factors that may be no longer operative but are now a part of the child's physical history.

In this hasty survey of causes of malocclusion we may for convenience consider them under three headings: (1) Mechanical, (2) Nutritional, (3) Constitutional.

Normal development of the teeth and jaws is easily interfered with by the misapplication of mechanical pressures, as for example, in mouth breathing, hand pillowing, or finger sucking. In normal respiration there is a partial vacuum in the mouth; the tissue of the tongue exactly fills the oral cavity so that there is an outward pressure upon the teeth; the lips and the cheeks exert an exactly equal inward pressure upon the dental arches with the result that the teeth are readily maintained in normal relation by the locking or interdigitation of the cusps. In mouth breathing or finger sucking the vacuum

within the mouth is broken and instead of the balance of forces mentioned we have the support of the tongue and lips diminished and that of the cheeks increased. Superimposed on this imbalance of forces are the pressures of the fingers or the abnormal position of the tongue tending frequently to push the lower teeth backward and the upper front teeth forward and to press the sides of the dental arches inward.

The forces just mentioned are intended to be illustrations and do not operate with uniform results. This is probably one reason why the orthodontist and pediatrician do not always agree on such matters as habits, adenoids and tonsils. It is unlikely that malocclusion ever results from the operation of a single etiological factor. If such were the case all children who suck their thumbs or fingers or who have enlarged adenoids would have crooked teeth and we know that this is not true. Sucking, for example, is an entirely normal thing for a child to do at a certain stage of development. It is only when such a habit is carried to an extreme that it becomes abnormal and often the indulgence can be considerably prolonged before any real harm results. At this point we may encounter one of the effects of our second group of causative factors, i. e., the nutritional. It should be obvious that teeth supported by bone of good quality can withstand much more adverse pressure than when the quality of the bone is not good. This is the very special field of the pediatrician and I have many times been astonished with the admirable results I have seen when he has regulated a child's nutrition.

The orthodontist and the pediatrician sometimes differ in suggested treatment when confronted with a sucking habit. The proper course of action should be determined by an attempt to consider all the factors involved. Inquiry should be made into the child's environment to ascertain, if possible, why he wants to indulge in the habit. The harm resulting from the indulgence should be weighed against the possible harm that may result from attempts to correct the habit. I do not like the term "break" in this connection because so often when a habit is forcefully broken, not only is there the possibility of psychologic damage but in many cases there is substituted another habit still more damaging and difficult of control, as for example, lip sucking in place of finger sucking. Therefore, before a pediatrician advises the anxious mother to disregard sucking habits he should acquaint himself with the harm that can be done to the anatomical structures, particularly the teeth and jaws.

If the desire for the habit indulgence cannot be reduced by improvement of environmental factors, I prefer to suggest an attempt to hinder the indulgence and to substitute some other activity. Some orthodontists¹ report considerable success in stopping thumb sucking by the use of an orthodontic appliance which takes the comfort out of the habit by hurting the thumb a little when

it is placed in the mouth. A point well to remember is that when a sucking habit is the only force interfering with tooth position there will be considerable, if not complete, improvement in the condition of the teeth when the habit is stopped. Because these factors seldom operate singly, however, the stopping of a thumb sucking habit can result in but little benefit to the teeth if in the meantime the patient has ceased to be a nasal breather and the lower lip occupies the space between the upper and lower teeth. Orthodontic treatment is the only hope of establishing normal function in the mouth and even these results will probably not be permanent if the post-nasal space is blocked off by hypertrophied tissue or cut down to inadequate size.

It is well known that not all children with malocclusion have enlarged adenoids and tonsils. There are children with enlarged adenoids and tonsils who do not have malocclusion. Equally well known to the orthodontist is the fact that there is frequently a very direct relation between these two conditions. It is my belief that the decision as to what to do with the child's nose and throat should be made by the pediatrician and the orthodontist in consultation by attempting a consideration of all the factors. It is agreed by all physiologists that the disuse of any organ or part brings in its train a progressive loss of function and atrophy of the tissues. It is not proper to consider the mouth, teeth and jaws and the nose and throat separately where there is both malocclusion and abnormal pharynx relations. Attempts to treat malocclusion without attention to the nose and throat result too frequently in "teeth that were straightened but went back again." Removal of tonsils and adenoids without attention to the teeth and breathing habits also result in "adenoids that grow back again." The well-being of the whole child is the proper approach.

Tonsils and adenoids may not be markedly diseased but may be so enlarged that the resultant loss of function is an actual cause of malocclusion. Obviously the possibility of focal infection or any systemic impairment as sequelae of diseased tonsillar tissue is the concern of the pediatrician but there may exist a condition where the orthodontist would favor removal of the excess tissue for more or less mechanical reasons. As one pediatrician² has aptly said, "the side-tracking of the nasal passages and accessory sinuses in the phenomena of respiration must never be permitted."

There can be no doubt I presume that in years gone by there have been far too many children whose adenoids and tonsils have been removed without proper regard for their best interests. Too great a swing in the opposite direction, however, should be avoided. A child who runs a low temperature, eats poorly, breathes badly and fails to gain either in general or as regards the dental structures should be referred to the pediatrician. The careful orthodontist is never hasty in making a diagnosis or commencing treatment for such a child but prefers a consultation with the pediatrician and possibly a period of observation, keeping meanwhile records that are most revealing as to the operation of growth factors.

Another problem having more or less of a mechanical effect is the question of the frenum labium. I do not

wish to say that there is no such a thing as an abnormal frenum but I am certain it is not nearly so common as was formerly thought. I have not seen one in twenty years that I thought warranted surgical removal though I have examined hundreds of children in that time. The permanent upper central incisors usually erupt between six and seven years of age and at the time of eruption there is nearly always a space between them—sometimes a wide space. The inner attachment of the frenum being high on the alveolar bone the fibers simply hang in the space between the incisors. In normal development the space is closed as the second incisors and canines erupt into the dental arch and any excess tissue is absorbed. An operation for removal of the frenum in cases of this kind is not indicated; it does no good; and it may leave scar tissue that will prevent the normal movement of the teeth to close the space.

In the event of considerable tissue between the teeth it is sometimes necessary to move the teeth together by orthodontic means. When this is done the excess tissue squeezes out from between them like snow ahead of the snow shovel but in a short space of time it absorbs away. Neither the dentist nor the pediatrician should advise an operation of this character without consultation with an orthodontist. If an operation becomes necessary it should usually be done after the orthodontic treatment rather than before.

Results of orthodontic treatment both from the viewpoint of the readiness with which they are attained and their permanence are in proportion to the favorable physical conditions of the patient. This fact leads to mention of those cases in which nutrition of the patient plays a part. Inherited patterns set the first limitations of growth and development. The environment however determines what the ultimate attainment shall be and nutritional factors are just as important as those of a mechanical nature, examples of which have been discussed.

A balanced ration containing all the essential vitamins, minerals and other substances for the growth of bones and teeth is basic but by no means the whole story. This material must be prepared for digestion, then assimilated and metabolized into the desired structures. This again is the particular field of the pediatrician. He is the one to consider congenital nutritional agencies, the blood serum and its calcium content and idiopathic bodily disorders, etc. It is not always easy to regulate diet in the face of our peculiar modern civilization and the climate in which we live in Minnesota, as well as certain allergic reactions.

My observations over a quarter of a century suggest that while the pediatrician may now be successful, to a degree, in building a somewhat better quality of teeth for his patients by supervising their nutrition, his efforts have not been quite so successful as regard their supporting tissues. We must of course be careful not to place too much emphasis upon a single factor when we know that there are several operating simultaneously in the development of the child.

The group of children afflicted with unfavorable allergic reactions constitute a problem to try the skill of the best pediatrician and orthodontist in combination. The

untoward effects are both mechanical and nutritional. The problems confronting the pediatrician and orthodontist are not like those of the stock breeder who can discard the individuals he regards as unsuited to his work. We are compelled to do the best we can, regardless of mixed inheritance and varying nutritional factors.

A good approach to a discussion of these things as they apply to orthodontics is von Liebig's old Law of the Minimum: "Among the substances nutritionally essential for growth that one which is furnished to the organism in minimum amount (relative to the need for growth at the normal rate) will determine the rate of growth, the organism growing only to the extent that it can increase in size and at the same time conform to the normal composition of its kind."³ The truth of this law has been amply proved⁴ as regards proteins. That it is not applicable to minerals however was shown by Sherman.⁵ When laboratory animals were fed diets that varied only as to calcium they found that increase in bodily weight was practically the same for all groups but the rate of calcification of the skeletons (as shown by ashing) was markedly different. In other words, while the body will not grow to full size if deprived of certain proteins (lysine) it may grow up with calcium-poor bone or iron-poor blood if deprived of these minerals. A child with poor bony structure is not a good orthodontic risk. Tooth movement may be easy but it is difficult to maintain the teeth in their new position.

As Todd⁶ has said, "The mineralization problem of the orthodontist implies much more than the provision of an adequate mineral ration for the child." Stated baldly it means that the orthodontist must rely upon the minerals of the jaws securely fixing in their new alignment the teeth which he has rearranged. The teeth are not sunk in posts of cement. They are more correctly likened to a team of horses whose efficient coöperation depends upon the bridle of occlusion. The harness must be strong enough to hold the teeth in position but it must also be resilient enough to ease off here and there as the strain of the work requires. One must realize that in mineralization one is not studying the construction parts of a permanent substance but rather the fabrication of a supporting framework, the pattern of which may, indeed, be permanent but the constituent parts of which are constantly undergoing change and reconstruction to meet the needs of the moment in alignment and activity. Our problem then divides itself into estimation of two factors: namely adequacy of structure and adequacy of response. . . .

"Several minerals enter into construction of bone but since bone contains about 99 per cent of the calcium of the body, calcium is considered the chief of minerals. . . . Children of impoverished constitutions, whether from prolonged toxemia, protracted ill-health or inability to utilize minerals, show pronounced reduction of the labile minerals with encroachments even on the trabeculae themselves which become thinner or fragmented. . . . Demineralized bones of this type are not defective in their potentiality for repair. They fracture easily but they form callus though of a demineralized type. Bones such as these are simply inadequate, unperverted

in functional character. . . . It is the demineralized bone which so impedes the work of the orthodontist. There is no efficient response which the orthodontist can call to his aid in fixing the realignment of the teeth brought about by the expenditure of the orthodontist's time and the patient's patience."

Nutrition in relation to orthodontic treatment is but one of the many factors that must be considered. The best regulation of nutrition of the patient before or during orthodontic treatment is in no sense a substitute for skill and judgment on the part of the orthodontist but should be regarded as one favoring his success.

Many patients who have had every attention to the mechanical and nutritional conditions previously mentioned still develop malocclusion of varying severity. These are manifestations of the so-called constitutional factors, contemplation of which causes the other factors, however complicated they may be, to appear simple and straightforward.

Constitutional dyscrasia as a cause of early pathological conditions of the teeth, irregularities of placement, malocclusions or even absence of tooth buds are often obscure indeed. They might be considered under four general divisions: (1) Hereditary ectodermal dysplasia—there may be lack of tooth development, missing teeth or irregularities of arrangement. (2) Mongolism—teeth may be tardy, structurally defective, or abnormally placed. (3) In syphilis the extremes may be represented as to development. There may be a mild infection, difficult to diagnose without complete tests. Hutchinson's teeth may be a sign. (4) In hypothyroid the extreme is represented by the cretin in whom there may be almost any type of tooth anomaly.

Often the family history of a child with dental defects will carry the suggestion of constitutional defect. Inquiry shows that the majority of parents of such children suffer from similar defects. In support of the importance of heredity in these conditions Kerley⁷ goes on to say that many such children have blood with a normal calcium content. No trustworthy evidence has been presented to show that any benefit results from the administration of calcium and phosphorus. We can only conclude that heredity plays the leading role in such conditions. The further study of the defective genes should be most enlightening.

Malocclusion is progressive in character. The condition grows worse as time goes on. A pronounced disharmony in the relation of the deciduous teeth is almost certain to be followed by a disturbance in the permanent teeth. There is but little dental development after the child reaches 13 or 14 years of age, hence the greatest benefits result from early recognition and prompt corrective treatment. There are some conditions that should be treated in early childhood.

It is a rare orthodontic problem indeed that cannot be greatly improved by complete coöperation between the pediatrician and the orthodontist no matter how obscure the etiological factors may be. It is greatly to be regretted that economic factors often intervene to prevent this coöperation; certainly nothing else should ever do so.

Congenital Diaphragmatic Hernia

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A CONGENITAL diaphragmatic hernia is a protrusion of abdominal viscera into the thoracic cavity, through a defect in the diaphragm. The hiatus results from failure of fusion at various points in the diaphragm of the embryo.

EMBRYOLOGY

A brief review of the embryology of the diaphragm reveals that it is a complex structure and arises from many sources. The ventral portion, known as the septum transversum, arises opposite the third and fourth cervical vertebrae, migrates caudally, and about the third week of fetal life comes to rest opposite the twelfth thoracic vertebra. When the septum transversum assumes its final position opposite the twelfth thoracic vertebra, there appears an outgrowth of mesodermal cells from the dorsal mesentery which fuses with the septum transversum and forms the median dorsal portion of the diaphragm.

Until about the fourth fetal week the pleural and peritoneal cavities communicate, this communication is known as the pleuro-peritoneal canal. About the fourth week this canal, or hiatus, is closed by a double fold of serous membrane derived from the pleura and peritoneum. This pleuro-peritoneal fold forms what is known as the pleuro-peritoneal membrane portion of the diaphragm. Thus it is seen that the lateral portions of the diaphragm are formed from the pleuro-peritoneal membranes and growth from the body walls.

It is readily understood that numerous fusions must take place in the embryonic diaphragm before we have a complete anatomical structure. Failure of fusion between any of the above mentioned portions of the embryonic diaphragm results in defects through which herniation of abdominal contents may take place into the pleural cavity.

TYPES

The site of a diaphragmatic hernia is predominantly on the left side. Some authors state that they are about twelve times more common on the left than the right side. The liver on the right side protects the diaphragm if there should be a potential weakness.

1. The most frequent congenital hernia found on the left side is through the foramina of Bochdalek. This hiatus lies in the postero-lateral segment of the diaphragm and represents a failure of fusion between the dorsal mesentery and pleuro-peritoneal membrane.

I have operated several patients which represent this type. One of the cases I wish to report is a right-sided hernia.

2. Hernia through the esophageal hiatus represents the most frequent type. However, it does not give symptoms and consequently is usually not recognized until late in childhood or adult life.

3. A frequent hernial site is the antero-lateral segment of the diaphragm. This hiatus represents a failure of fusion between the septum-transversum and the pleuro-peritoneal membrane.

4. If the fibers fail to fuse in the sterno-costal region we have the foramina of Morgagni. Hernia through these foramina is rare but it has been reported. Lateral X-ray views are extremely helpful in diagnosing this type of hernia; as a matter of fact, they definitely determine the site of herniation.

5. Hernia through the dome of the diaphragm is difficult to understand. It is probably not a hernia but represents an eventration of the diaphragm.

6. Finally there may be complete absence of either half of the diaphragm.

PATHOLOGY

Keith says that "from an examination of these figures I am of the opinion that a considerable number of these cases might be successfully operated upon if the condition were recognized at the time of birth." Hedblom found that in a series of 210 cases of congenital diaphragmatic hernia under the age of one year, 75 per cent died before the end of the first month.

The literature reveals that the onset of symptoms is usually associated with the development of acute intestinal obstruction. There is a difference of opinion as to the time when the intestines pass into the pleural cavity. Because of the usual cephalic presentation it is conceivable that at least some of the abdominal contents pass into the pleural cavity during intra-uterine life. A review of case histories reveals that in all probability the intestine passed into the pleural cavity shortly before the onset of symptoms or at least there was an increase in the pleural content.

If the intestine has passed into the pleural cavity it is difficult to understand how gravity can influence its return to the abdominal cavity. The instant the baby breathes, negative pressure is established in the pleural cavity which should not only hinder the return of intestine to the abdominal cavity but should encourage the passage of still more into the thorax. Adhesions are absent in this type of hernia, the same as in other congenital hernia, so that reduction is fairly easy. If adhesions are present they will be confined to the omentum about the orifice. If strangulation occurs and the infant survives operative interference, it will probably develop a pleural effusion which goes on to suppuration.

Fortunately my cases presented no other physical abnormalities.

SYMPTOMS AND SIGNS

The symptoms of congenital diaphragmatic hernia are always referable to the cardio-respiratory or gastro-

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intestinal systems. The degree of pathological disturbance or severity of symptoms depends upon the amount of abdominal content which has herniated into the pleural cavity. Greenwald and Steiner, in reviewing 36 cases from 1 day to 1 month of age, listed the symptoms as follows:

SYMPTOMS	No. of Cases
Cyanosis	24
Peculiar single weak cry	8
Feeble attempts at respiration	8
Failure to breathe with heart beat present	8
Dyspnea	7
Difficulty in nursing	4
Convulsive attempts at respiration	2
Cough	2
Vomiting	1
Weight loss	1

Cyanosis is by far the outstanding symptom. It is usually of a severe degree and very alarming. This was the outstanding symptom in all of my cases. When the hernia is large it is readily understood why cyanosis is predominant. The cardio-vascular-respiratory embarrassment is severe and naturally the result is cyanosis. Many writers place a good deal of significance upon the peculiar weak cry immediately after birth, but my impression is that this would be a rather difficult symptom to recognize. Dyspnea or feeble attempts at respiration in the first hours of life should always make one suspicious that a diaphragmatic hernia may be present.

Difficulty in nursing, vomiting and cyanosis were the most alarming symptoms in my 9 day old baby.

Dextrocardia is listed as the most common sign. One writer goes so far as to say that it is pathognomonic of diaphragmatic herniae. This may be true for herniae on the left, but not for small herniae, or those on the right side. Both of my left-sided cases presented dextrocardia. Tympany and gurgling sounds on the involved side of the chest should awaken one to the probability of bowel being present in the pleural cavity.

The author's cases all presented marked retraction of the upper abdomen upon inspiration.

Author's cases:

SYMPTOMS	No. of Cases
Cyanosis	3
Dyspnea	3
Difficulty in nursing	2
Vomiting	1
Rapid irregular breathing	2
SIGNS	
Dextrocardia	2
Tympany on involved side	2
Gurgling on involved side	2
Retraction of epigastrium	3

DIAGNOSIS

Diagnosis according to Truesdale is more difficult than the operative cure. It is perhaps true that it is difficult to make a diagnosis from the history alone. Yet if we are presented with an infant that presents cyanosis, dyspnea, and has difficulty in nursing, it seems to me we

should be thinking of diaphragmatic hernia. If in addition to the above symptoms the infant presents dextrocardia, tympany and gurgling in the thorax, the diagnosis can almost be positively made. This applies particularly to the most frequent type of hernia we see in the infant, in other words, through the pleuro-peritoneal hiatus on the left side. A great deal of abdominal content is always present in the pleural cavity with this type of hernia and the symptoms and signs are prominent. Diagnosis is clinched by X-ray. The bowel can easily be diagnosed in the pleural cavity and when barium is administered the structures can be identified and the type of defect usually predicted.

DIFFERENTIAL DIAGNOSIS

1. *Intra-cranial hemorrhage.* The new-born is usually hypertonic or spastic, and convulsions frequently occur. Irregular respiration and cyanosis may simulate congenital diaphragmatic hernia. The nystagmus and pupillary findings indicate cerebral injury. If vomiting is present then the X-ray should be used.

2. *Laryngeal obstruction.* Chevalier Jackson described laryngeal dyspnea as an indrawing at the suprasternal notch, around the clavicles, and at the epigastrium.

3. *Atelectasis.* Cyanosis is present, and rapid respiration may be present. Dullness and bronchial breathing can usually be elicited.

4. *Massive collapse of lung.* This is usually due to plug of mucus in bronchus. According to Tow the onset is sudden, with cyanosis, labored breathing, dullness, bronchial, diminished or absent breath sounds on injured side. X-ray shows the heart shifted toward the involved side.

5. *Congenital pneumothorax.* Cyanosis and dyspnea are sudden in onset. Heart is pushed to opposite side. X-ray of distinct value.

TREATMENT

Hume as late as 1922 stated that hernia through the pleuro-peritoneal canal was unlikely to require surgical treatment, and that if it was done it was palliative only. Vannesson in 1912 reported 34 cases of congenital diaphragmatic hernia in the new-born (all discovered at autopsy) and stated that the prognosis was grave and that treatment was nil. Broca in Paris in 1914 reported the mortality at 90 per cent. Holt in 1917 stated that the hernia was not amenable to treatment. Pediatric texts by Ehrenfest, 1922, Cutler, 1923, and Haynes, 1928, did not even mention the subject. Richter in Abt's work, said that large congenital herniae offer little opportunity for surgical treatment. Griffith and Mitchell in 1927 said: "The condition is uncommon in children. There is no treatment possible except an operative procedure if incarceration occurs, and this is not likely to be of any avail. Kelly in 1929 said: "One should operate only if there are distressing symptoms. If it becomes strangulated, the constriction should be relieved and steps taken to prevent recurrence, and no further attempt should be made to close the hernial opening. And finally as late as 1934 Tremolieres warned surgeons to attempt only those cases in which the hernial orifice

could be easily closed. He believed that treatment should be palliative.

In 1935 Truesdale collected 303 cases from the literature of diaphragmatic hernia in infants and children, discovered as follows:

	U.S.A.	Foreign	Total
Autopsy	38	127	165
X-ray	45	45	90
Clinically	20	15	35
At operation	4	9	13

Of the 303 cases, 44 were operated upon with a mortality of 45.5 per cent.

Orr and Neff report that up to 1935 only 16 infants under 1 year of age were operated for congenital diaphragmatic hernia. The mortality was 47 per cent.

Only within the past few years has surgical intervention been adopted in the treatment of congenital diaphragmatic hernia.

Barrett and Wheaton as late as 1934 quoted Hume as follows: "Surgical treatment is unlikely to be required for hernia through the pleuro-peritoneal hiatus, and no attempt should be made to transfer the intestines to the abdominal cavity."

Conclusions like this in the light of present-day work seem almost ridiculous. It is now generally agreed that an infant showing signs and symptoms of congenital diaphragmatic hernia should be operated in the early hours, or days, of life. We should not wait until signs of strangulation develop. It is true that an absence of half the diaphragm may be hopeless, but all other types of hernia can, in all probability, be cured. The amount of intestine in the pleural cavity bears no relation to the size of the orifice. Fascial transplants from the kidney region may be necessary to close the large openings, but they can be closed.

PREOPERATIVE TREATMENT

The preoperative preparation of these young infants must be carried out with extreme care. Naturally, they must be gotten into the best possible operative state. This procedure must be done in conjunction with a pediatricist in order to assure the best possible care. Blood, properly grouped and matched with the donor, must be on hand for an immediate transfusion if necessary. Subcutaneous fluids must be given for 12 to 24 hours preceding the operation. It may be necessary to give glucose intravenously several hours before operating. The stomach should be thoroughly washed out 30 to 60 minutes previous to operation. For the conservation of body heat wrap the infant well in flannel or cotton-batting. On the operating table place hot water bottles, well protected, about the infant.

ANESTHESIA

Truesdale attributes his operative success to positive pressure anesthesia. Most writers agree that the closed method of anesthesia, with some positive pressure, is probably the safest. In spite of the fact that ether given

by the open drop method is a very satisfactory anesthesia in infants, it does not prove successful in these cases.

In our nine day old patient we tried intratracheal anesthesia but because of displacement of the trachea we were unable to pass the catheter into the trachea. We then attempted ether by the open drop method but it was unsatisfactory. We resorted to NO₂ and oxygen, but it would not give the proper relaxation, and finally we used ethylene and oxygen which proved to be the anesthesia to which the baby responded, and offered the best possible working conditions.

We must insist upon anesthetists who understand anesthesia in infants, because without such assistance surgeons cannot possibly perform their tasks.

APPROACH

Among authors there is a difference of opinion regarding the approach. Some prefer the thoracic approach and advance their reasons for such. Others prefer the abdominal, and argue just as strongly for it.

Satisfactory reduction is the crux of the operation, and whichever method various men wish to use is a matter of personal opinion and ability.

Personally, I have used the abdominal approach on all my cases and my experience has been highly satisfactory. I feel that it is easier and simpler to pull intestines through a small aperture than it is to push them through. Both methods produce a pneumothorax, but through the abdominal route one does not get the complication of a hemothorax, which was the cause of one death in the literature. Also by the abdominal route one can re-arrange the abdominal content somewhat, and if the abdominal cavity is not large enough for the contents you can easily remove gas from the bowel by several well placed openings with immediate closure.

If the orifice is very large and the edges cannot be approximated, then the fascia from the anterior and superior aspect of the kidney can be mobilized and sutured to the peritoneum on the anterior aspect of the orifice. I believe that a combined thoraco-abdominal approach is too much surgery for infants and should not be done except under dire circumstances. There is a variance of opinion on paralysis of the phrenic nerve. It was not necessary in my cases.

OPERATION

A subcostal, or high rectus, incision on the involved side will give the proper exposure. The leaf of the diaphragm and the aperture are readily accessible, and the bowel passing through the hiatus is easily identified. Gentle traction on the bowel will usually start the reduction but if suction is too great and the intestine does not come out of the pleural cavity easily, pass a hemostat through the orifice, stretch it and permit air to pass into the pleural cavity. This positive pressure in the cavity will permit the bowel to be easily withdrawn. Gently and quickly, withdraw all of the bowel and make sure that it is all in the abdominal cavity. Look for the spleen and if it is not found, look for it in the pleural cavity, in many instances it has been herniated and must be brought down into the abdominal cavity. Freshen up

the edges of the orifice by rubbing with a dry gauze sponge. Then place as many interrupted sutures as you think necessary through both edges of the opening. Some men use braided silk, some chromic. My closures were done with chromic gut No. 1. Take a good healthy bite with your sutures so that the diaphragm will not fray out. Tying the sutures will produce a good firm approximation. Get out of the abdomen as quickly as possible, closing the abdominal wall in layers and using plenty of stay-sutures.

POSTOPERATIVE

Have the anesthetist give the baby CO₂ at the conclusion of the operation. If you are working under positive pressure, the lung perhaps can be actively expanded. Keep the infant well wrapped to conserve body heat and combat shock. Place the baby in a bed elevated about 30 degrees and under an oxygen tent for the first few days. The oxygen tent saves the baby's energy, lessens the chance of respiratory infection and maintains a more even temperature. The postoperative feedings and fluid intake must be done in the strictest cooperation with a pediatricist. I feel that he plays a much more important role in the after-care than the surgeon.

If you wish to needle the pneumothorax and withdraw the air, the heart and mediastinum will immediately assume their normal position. Neither of these patients were needed and we found that it took the collapsed lung between 10 and 14 days to fully expand.

If a pleural effusion should develop, aspirate as often as is necessary, and treat it as any other empyema.

CASE REPORTS

Case 1. A 7 lb. 8 oz. girl born at term, breathed spontaneously and cried lustily. The following day she was put to breast five times and nursed well on all occasions. The progress was uneventful until the fourth day of life when after a feeding she became cyanotic. This cyanotic spell lasted but a few minutes. Following the next feeding the cyanosis became so severe that oxygen was administered. The resident pediatricist reported this attack as so critical that he thought the baby would expire. The baby was placed in an upright position and oxygen was administered continuously. Vomiting now became present after every feeding. Respiration was rapid and irregular. Examination at this time revealed a dextro-cardia, and no breath sounds were heard in the left chest. X-ray revealed a left-sided diaphragmatic hernia, which had the appearance of all the bowel being in the left pleural cavity.

After a few days observation, the condition of the baby remained precarious and surgical interference was decided upon.

Upon opening the peritoneal cavity and exploring the left dome of the diaphragm, we found the hernial opening to be posterior and lateral, the foramina of Bachdalek. The intestines were gradually pulled out of the pleural cavity and reduced easily. All of the intestinal tract, with the exception of the descending colon was in the pleural cavity. The stomach was beneath the diaphragm. After reduction of the hernia it was observed that the hiatus in the diaphragm was about 2½ cm. long and 1 cm. wide. The spleen was also found in the pleural cavity and replaced easily.

Closure of the defect in the diaphragm was made with No. 1 chromic gut, interrupted sutures. Some difficulty was encountered in closure of the abdominal wall but eventually room was found for all the intestines and closure accomplished. The abdominal wall was closed in layers without drainage.

The postoperative course was uneventful.

This infant is now 16 months of age and in perfect health.

Case 2. Recently I saw a new-born male 6 hours old who

presented a diaphragmatic hernia with the following history.

At birth it had a peculiar weak cry, and respiration was extremely embarrassed and irregular. The obstetrician and pediatrician thought they were dealing with a laryngeal obstruction but examination of the larynx was negative. On inspiration there was marked supra-sternal, supra-clavicular and xiphoid retraction, waves of cyanosis were extreme. Congenital pneumothorax was then thought of and an X-ray examination of the chest revealed a right-sided diaphragmatic hernia. The infant being almost moribund and death inevitable it was decided to take a chance on surgical interference.

Without any anesthesia whatever, and oxygen being administered continuously, the peritoneal cavity was hastily opened. The left dome of the diaphragm was normal. Esophageal hiatus was normal. There was very little bowel in the peritoneal cavity. Upon carrying the examining finger over the liver from the right side, the opening was found in the right diaphragm. It was an extremely large opening through which passed almost the entire gastro-intestinal tract. After the bowel had been removed from the pleural cavity it was observed that about one-half of the liver was in the pleural cavity. When the liver was brought down into the peritoneal cavity the hiatus seemed to be about the entire posterior half of the diaphragm. It appeared as though that portion of the diaphragm formed from the pleuro-peritoneal fold, the dorsal mesentery, and part of the body wall, had all failed to develop. There was a remnant of the portion formed from the body wall and it was possible to suture this to the septum-transversum and close the large opening completely. Because of the extreme condition of the patient this was done with a running chromic suture. The bowel was then replaced in the peritoneal cavity with great difficulty and the abdominal wall closed with through and through sutures. When the last few sutures were being placed in the abdominal wall the infant expired. Air was immediately withdrawn from the right pleural cavity and the infant placed in the mechanical respirator but to no avail.

DISCUSSION

The severe degree of anoxemia that this infant presented for about three hours, would have produced permanent cerebral damage. On the other hand I believe this infant was a better operative risk during the first three hours of life than after the cyanosis developed.

The point I am trying to develop is, that given an infant with such severe dyspnea and cyanosis, one must think at once of a diaphragmatic hernia and the moment the diagnosis is made proceed with surgery. There is no doubt that many babies die in the first few hours of life from unrecognized diaphragmatic hernia and a great deal of this diagnostic responsibility rests upon the shoulders of the obstetrician. In the severe case I don't believe that anything is to be gained by waiting; we must accept the grave responsibility and attempt to save the infant's life.

RESULTS

None of my successful cases has had a recurrence, as occasionally happens, and likewise, they presented no other abnormalities.

SUMMARY

An additional case of congenital diaphragmatic hernia is added to the literature. The diagnosis was made clinically, verified by X-ray, patient operated on the ninth day, and cured.

With our present surgical armamentarium, if we expect to reduce the mortality of congenital diaphragmatic hernia, we must be operating these infants in the first hours or days of life, rather than weeks or months.

Hemangiomas*

Classification and Treatment

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HEMANGIOMAS or blood vessel tumors are the most common tumors of childhood. Clinically all congenital structural anomalies are considered birth marks. Virchow¹ believed that hemangiomas were composed of newly formed vessels or vessel walls. However, no one is able, either clinically or histologically, to state definitely that hemangiomas are proliferations (angiomas) or ectasias (hyperplasias). Virchow was unable to differentiate angiomas from anectasias.

Kyrle² believed a nevus was any structural formation resulting from embryonic rests which develop before or after birth and proliferate to form the structure which they have the potentiality of forming. Nevus cells are unnecessary in the diagnosis of nevus vasculosus. Ribbert³ considered hemangiomas the results of the natural development of matrix misplaced in the tissues and in the walls of the blood vessels where they proliferated to form young sprouts. Ewing⁴ believed hemangiomas were neoplasms composed of newly formed vessels. He agreed with Watson and McCarthy⁵ who also considered hemangiomas to be true neoplastic processes. Laidlaw and Murray⁶ proposed that they were phylogenetic remnants of early vascular tufts which served as accessory lung tissue in the skin of reptiles and lower forms, and their occurrence in man suggested that they were remains of these tufts that did not disappear in early embryonic life.

The etiology of this true neoplasm or congenital malformation is unknown. Virchow¹ considered it due to intra-uterine irritation in the region of the embryonic fissures with a resulting faulty fusion. Ribbert³ believed the cause to be a congenital, developmental disturbance in circumscribed vascular areas allowing them to proliferate independently. Unna⁷ thought that intra-uterine compression or pinching was the causative factor. Ewing⁴ described it as a developmental anomaly in certain elements of the vascular system, of congenital origin, which retain embryonal character. Blaisdell⁸ insinuated that hemangiomas are either present at birth or appear in children within the first six weeks after birth by saying "if hemangiomas are not present at the end of the first six weeks after birth, the parents should be happy."

Clinically and histologically hemangiomatous nevi can be classified into the following groups: (1) *hemangioma simplex*, (2) *hemangioma hypertrophicum*, and (3) *hemangioma cavernosum*. The groups clinically and histologically frequently overlap into one another and thus we see a portwine stain associated with a strawberry birth mark or a strawberry birth mark with a cavernous hemangioma. Occasionally we see also associated with a hemangioma, a lymphangioma which clinically shows

clear cystic areas in the presence of red areas of a hemangioma.

HEMANGIOMA SIMPLEX

The hemangioma simplex group includes capillary angioma either arterial or venous, such as nevus araneus, nevus flammeus or nevus vinosus, and nevus telangiectasis nuchi of the newborn. Histologically, the hemangioma simplex group consists of an increase in the number and size of the arterial and venule capillaries. They are localized entirely within the upper cutis and directly under the epidermis. This location is the cause for the bright red or highly colorful appearance.

The *nevus araneus*, spider nevus, is considered by some to be an overgrowth of capillary loops. Clinically, it is a red papule from 2 mm. to 5 mm. in diameter. Under glass pressure or diascopy, it can be seen to have a central dilated venule with radiating capillaries. This condition is best treated by electrocoagulation or desiccation. Eller⁹ advocated electrolysis using a current of $\frac{1}{4}$ to 4 milliamperes in strength.

The other conditions in this group can be classified best as nevus flammeus, or portwine stain, which have been, for the most part, refractory to all forms of treatment. At times treatment makes them appear more prominent and grave. Carcinoma has been known to develop in nevus flammeus following repeated roentgen ray exposures. Finzi¹⁰ stated that macular lesions of this type that do not disappear on diascopy will be resistant to all forms of therapy excepting surgical excision and grafting. Sutton and Sutton¹¹ and Kaessler¹² believed that there was a difference between the occipital telangiectatic nevus of the newborn and ordinary nevus flammeus, but no such difference has been noted histologically. The clinical difference is that telangiectatic nevus which frequently involves the occipital scalp, forehead, and nose of newborns, disappears spontaneously within the first year of life. It is estimated that one in every eight newborns has this condition.

HEMANGIOMA HYPERTROPHICUM

Hemangioma hypertrophicum includes the ordinary strawberry nevus, hemangioma plexiforme and hereditary familial telangiectasis of Rendu-Osler-Weber. Clinically these are 3 mm. and larger, purplish, elevated, have a nodular surface and are compressible. They may ulcerate and have been known to result in serious hemorrhage. Occasionally, lesions clinically resembling the hypertrophic hemangioma, develop into hemangio-endothelioma which are potentially malignant.

Histologically, these lesions consist of large numbers of small dilated vessels located in all layers of the cutis. Occasionally these vessels extend into the subcutis and adjacent underlying structures. The vessels are lined with a hypertrophic neoplastic endothelium which at

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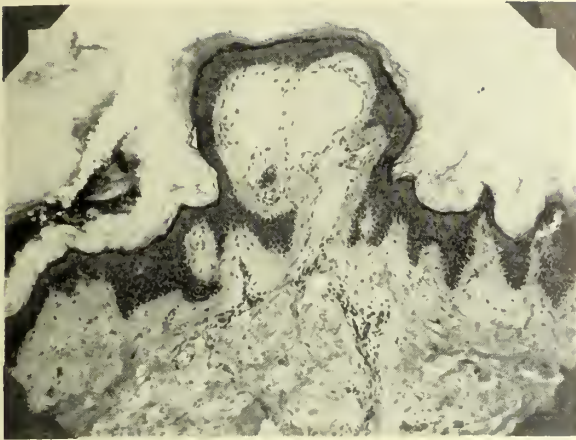


Fig. 1. Hemangioma Simplex (x90). Dilated capillaries in cutis just beneath the epidermis.

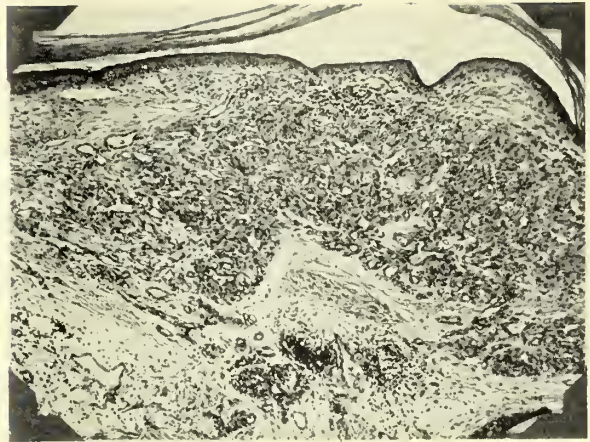


Fig. 2. Hemangioma Hypertrophicum (x90). Upper and middle cutis filled by proliferating and dilated capillaries.

times practically occludes the lumen of the vessels and appears as compact groups of cells. When such is the case, one can visualize the possibility of this being the transitional stage of hemangioma to hemangio-endothelioma, a local malignancy.

The treatment of this form of hemangioma has varied from the most radical to the most conservative. All methods of treatment have found advocates. At the present time there are four definite schools of therapy:

1. Complete surgical excision of the hemangioma or of the scars following a previous unsatisfactory or neglected treatment.
2. Radiation therapy using X-ray or radium. The most conservative form of this treatment is an application of one-half strength radium plaque filtered by 0.1 mm. of aluminum for an exposure of 12 to 15 minutes once a month until the lesion disappears.
3. Cauterization by electrocoagulation or freezing with solid CO₂.
4. Injection therapy, using drugs of all types.

The general principles of radium treatment are to treat as early as possible with minimum dosages for the more immature the lesion the better it responds to radiation therapy. The smaller the radium exposure, the less likelihood is there of radium injury to the skin. McKee¹³ stated that usually two or three treatments of radium were sufficient for a strawberry nevus and advised shielding the normal skin very closely. When the nevus involves the scalp, eyelids, or eyebrows, radium treatment causes no destruction of the hair bulbs, since the beta rays are absorbed before reaching the hair bulbs, which are below the nevus.

Figi¹⁴ used electrocoagulation, employing a special form of electrode, a rigid steel wire insulated with vulcanite except for the 3 mm. of its sharpened end. He cautioned against too extensive coagulation. Solid carbon dioxide has been used advantageously in some of these cases, applying it under moderate pressure directly to the hemangioma for 15 to 20 seconds. When healed,

this causes a soft superficial white scar but does not affect the deeper vessels.

Light¹⁵ summarized the history of injection treatment since the discovery of hypodermic syringe in 1851 and listed the following chemicals that had been used: ferric chloride, iodotannic acid, perchloride of iron, boiling water, phenol, iodine, potassium iodide, arsenphenamin, quinine, bichloride of mercury, sodium salicylate, sodium chloride, antipyrine, sugar solutions, quinine and urea. We used 95 per cent alcohol, injecting it directly into the lower central portion of the nevus in 0.1 to 0.3 cc. amounts, using a tuberculin syringe and a 26 gauge needle. Frequency and the amount of injection are determined by the size and depth of the lesion. We have also used Andrews and Kelly's¹⁶ method, quinine and ethyl carbamate solutions 5 per cent, but have found that it offers no advantage over the alcohol injection and that it has the disadvantage of causing a general reaction in persons who are hypersensitive to quinine. Riddle¹⁷ from a single puncture site, directed the point of his needle in a radial fashion causing contiguous spots of blanching which cover the entire tumor. He injects either 0.1 cc. of a 5 per cent sodium morrhuate or 0.1 cc. of a 10 per cent quinine dihydrochloride into each of the radial paths. The disadvantage of these drugs is, again, the possibility of reactions in hypersensitive persons.

All forms of injection are administered in the same manner. Following the injection, bleeding from the puncture site is controlled by pressure with gauze held in place by adhesive. Sloughing with its resultant scar is the result of either too much solution being used, too superficial infiltration of the solution or injection of a hemangioma which is in a pre-slough stage. Residual superficial telangiectasis following the injection of the deeper portions of the tumor is easily treated with superficial cauterization with a microcautery or freezing with solid CO₂. Kaessler summarized the injection treatment very well when he stated that he favored it because it was inexpensive, simple and gave favorable results.

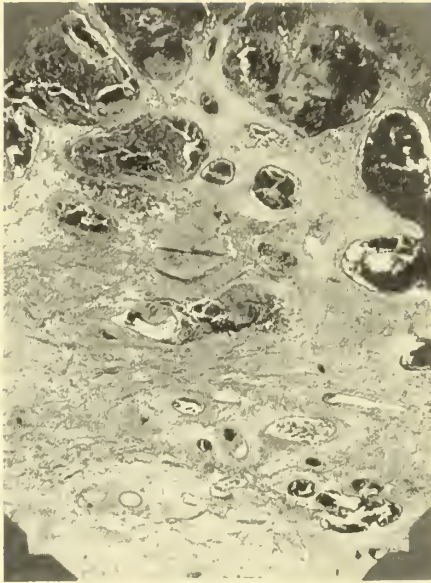


Fig. 3. Hemangioma Cavernosum (x17). Cutis invaded throughout by dilated vessels and spaces which contain clots and organized thrombi.

HEMANGIOMA CAVERNOSUM

The cavernous hemangioma is usually a large tumor mass, bright red to deep purple, depending on its depth below the surface of the skin. In children, it is located most frequently on the scalp and face. Occasionally, the extremities, mucous membranes and internal organs are involved. The skin lying over the deeper lesions is smooth, whereas over the superficial lesions the surface is lobulated. The tumor is soft and compressible. Occasionally, on palpation, one can feel a pulsation; this indicates its direct connection with a large vessel.

Histologically, there is involvement of the deeper vessels. Ribbert³ noted the absence of capillary anastomosis with the vessels in the adjacent skin. He believed the condition to be a proliferative new growth causing a lengthening and multiplying of the new vessels. Unlike the larger ones, the smaller lesions seem to be encapsulated. In the cutis, dilated veins and enlarged spaces are seen. These channels anastomose with each other and appear like a sponge on section. At all times, clot formations can be seen in some of the spaces. The clots in the very early stages show only striations of the red blood cells whereas in older lesions the clots are completely organized thrombi. These lesions have been known to metastasize, but as a rule they are very slowly progressive. Their growth is accelerated by menstruation and gestation.

As a rule, cavernous hemangioma regresses spontaneously, but recurrence following excision sometimes occurs. Ligation of the afferent artery at times is sufficient to produce complete cure. Continuous pressure over the lesion also produces a cure. Radiation treatment has, at times, been successful if used early. McKee¹³ used the tubular applicator containing 25 mg. of radium or 25 millicuries of radon screened by 1 mm.

of brass, 0.5 mm. of silver and 3 mm. of rubber, at a distance of 1 inch from the lesion, treating 1 inch of surface at a time. This should be used if there is no improvement after the first or second treatment following 10 to 20 minute exposure using a flat glazed half-strength applicator filtered by 0.1 mm. of aluminum. The time exposure is usually two hours. The screening and distance remove the effect of the softer beta rays and allow the deeper penetration of the gamma rays. If the area to be treated is large, the exposure time should be shorter than that for 1 square inch because of overlapping and secondary radiation. Early treatment with radium is necessary for successful results in treatment of cavernous hemangioma preferably in the first three months of its existence. McKee¹³ stated that radium treatment given after two years has a doubtful outcome. Interstitial implants of radon seeds and radium needles in the dosage of $\frac{1}{4}$ millicurie for each cubic centimeter of tumor tissue has been used in the bulky type of cavernous hemangioma. Andrews¹⁸ advocated dosages three to four times as great. Larkin¹⁹ mentioned the possibility of embolism as a result of the interstitial treatment. However, Figi, quoting Andr n noted no difference in the sensitivity of cavernous hemangiomas to radium at any time during the first year of life.

In the pulsating form of cavernous hemangioma, the treatment frequently necessitates surgical intervention and ligation with subsequent radiation, cauterization and injection of sclerosing solutions. The technic of these various procedures is much the same as the treatment for hypertrophic hemangiomas (or strawberry birth marks). Figi¹⁴ advocated electrocoagulation for treating cavernous hemangioma. This form of treatment is especially effective in the treatment of cavernous hemangioma of mucus membranes where the lesions are radium resistant. Watson and McCarthy admitted radiation was the best form of treatment in the first three months of life. They claimed their best results were obtained by injecting sodium morrhuate and by treating the resultant mottled surface with solid carbon dioxide. Light¹⁵ preferred injection of a 30 per cent solution of sodium salicylate. Riddle¹⁷ admitted that the more extensive hemangiomas were more difficult to treat by injection and should be treated with radium or surgery. He stated that the smaller cavernous hemangiomas responded well to injections of 0.5 to 1 cc. of 5 per cent sodium morrhuate, a similar amount of 10 per cent quinine dihydrochloride or a similar amount of sodium psylliate injected at weekly or monthly intervals depending on the local reaction. Two to eight injections were necessary for a cure. He further suggested a preliminary injection of 1 cc. of 2 per cent procaine into the area selected for treatment to avoid the pain of the sclerosing solution. Kaessler,¹² although advising radium for the deeper and more extensive lesions, advocated injection treatment of lesions under 4 cm. in diameter. He used 0.1 to 0.2 cc. of 20 per cent quinine dihydrochloride and urethane diluted with an equal amount of 2 per cent procaine hydrochloride. Andrews



A. Hemangioma Hypertrophicum.



B. The same as A, three months after beginning treatment with alcohol injections.

Fig. 4.

injected up to 2 cc. of 20 per cent quinine and ethyl carbamate which had been diluted with normal saline into cavernous hemangiomas when he was able to make an intravascular injection. Sweitzer²⁰ advocated the use of 0.1 to 0.5 cc. of 95 per cent alcohol, the larger amounts being used when the injection was intravascular or in the deeper cutis. He cautioned against the possible generalized reaction in the use of quinine injections in sensitized persons and mentioned the occasional use of 600R of roentgen rays filtered through 3 mm. of aluminum as a successful means of treating cavernous hemangioma.

The alcoholic injections are made at weekly intervals and the number of injections and the amount of each injection depend on the size, depth and resultant reaction of the preceding injection. At the first visit the patient is given one injection of 0.1 cc. into the deepest portion of the tumor. If a week later there is no sign of blanching or induration, 0.2 cc. is injected into the same area. If induration is present from the first injection, the adjacent soft tumor is injected in two areas. At all times it is preferable to inject the alcohol deeper than one judges necessary; it has been shown from clinical results that the resultant fibrosis set up by the alcohol not only shuts off the afferent vessel but also continues to proliferate and to collapse the angioma. The remaining fragments of the tumor are destroyed either with a fine pointed cautery or with freezing under very light pressure for 15 seconds with solid carbon dioxide which has been shaped to the lesion before application.

DISCUSSION

With few exceptions, all authors agree that capillary

angioma or portwine stains should be left alone, and patients advised to use some form of cosmetic preparations as coverings. Finzi stated that in macular hemangiomas which do not disappear on dioscopy, no forms of treatment except excision and subsequent skin grafting are successful. Lister²¹ reported spontaneous cure of strawberry nevi in 76 out of 77 patients within the first five years of life. He therefore advised against any therapeutic intervention. His criterion for spontaneous cure was growth of the nevus during the first year. The only failure did not show any growth during the first year and subsequently was removed during the fifth year. However, early eradication is important because of the tumor's invasiveness, likelihood of it being the seat of serious hemorrhage and its occasional tendency to become a hemangioendothelioma and metastasize. If one has once noted this he will be reluctant to allow a hemangioma to go untreated. Most authors therefore advocate the earliest possible treatment. The radium treatment, the choice of the majority of physicians, because of its successful cosmetic results, is dangerous in inexperienced hands. It is better to fail in a number of instances without damaging the skin than to succeed in removing the tumor and leave a disfiguring scar or atrophic, irregularly pigmented, keratotic area as a result of over-exposure.

The simplest and least harmful treatments are those of first choice. The injection treatment, if too superficial and regardless of the drug used, results in sloughing and scarring. One should bear in mind at all times that the needle point is in the deeper cutis. By injection, the deep feeding vessels are sclerosed and the superficial capillaries obliterated. In the refrigerating treat-

ment with solid carbon dioxide, one must be cognizant that only superficial tissue is destroyed and that the deeper vessel tumor remains unchanged. The disadvantage of the solid carbon dioxide treatment is that it leaves a soft white scar which at times is evident but never becomes keloidal. Solid carbon dioxide is most useful for small thin lesions on the covered portions of the body where the resulting scar is cosmetically unimportant. It is better, therefore, to inject and destroy the deeper structures first, allowing the superficial portions of the tumor to be secondarily obliterated as a result of the underlying sclerosis. Finally, refrigeration or cauterization of the remaining fragments completes the treatment. Electrocoagulation necessitates a special electrode and a well developed and experienced technic. All unsuccessfully treated lesions should be treated by excision and subsequent skin graft.

SUMMARY AND CONCLUSIONS

1. Except for nevus flammeus, all hemangiomas are best treated in their earlier stages.
2. Radium is the most effective single therapeutic agent.
3. The combined treatment of injection and refrigeration or cauterization gives equally good results.
4. With any type of treatment, it is better to be unsuccessful than to cause disfiguring sequellae.

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Evaluation of Nutritional Status of Children*

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THAT the health of our children should become of increasing concern to us during the time of conflict is a fact which seems both significant and regrettable. A healthy child predisposes a good soldier. Adequate nutritional surveillance of our youth goes far to aid in the selection and training of men for national defense. Quoting Boudreau¹ we are surprised to learn that 50 per cent of British youth volunteering for the army were rejected. Adopting the suggestion of Sir John Boyd Orr, a random selection of 300 of those rejected was made and these subjects were fed a nourishing diet. When re-examined six months later, 270 of these were found to be fit for army service. Be that as it may, we trust that our chief concern as regards the nutrition of our children will continue to be the child *per se*. It is our purpose to attempt to outline the data

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needed by the physician to make a satisfactory evaluation of the nutritional status of the school child.

The factors which seem to be of significance for the evaluation of the nutritional state of children are varied and some, indeed, seem to be rather remote, from the strictly medical viewpoint. However, we believe a summary of these factors should include the following:

1. Height-weight indices, heredity, growth.
2. Economic-social status.
3. Dietary history—allergic, racial, faddist, habit, training, pathologic, psychologic.
4. Examination—physical, chemical, endocrine.
5. Knowledge of fundamentals of nutrition.

In the not too distant past information concerning the height and weight of the child was considered of paramount importance in the routine physical examination, but recent developments in the field of chemistry,

especially that of the vitamins, have disclosed gross inadequacies of this criterion. The reaction to this practice is the present-day tendency to disregard this information almost completely; whereas, actually, when interpreted in the light of other information, particularly that of the hereditary background of the individual, these data can give considerable assurance to the physician and reassurance to the parents. In addition, we know that a child showing normal progress in growth seldom is suffering from a deficiency disease.

Judging from the many surveys made here and abroad it would appear that the most important single piece of information for evaluating the nutrition of a child is his economic status. Where poverty is found, malnutrition exists. It is common knowledge that outspoken deficiency disease exists more frequently in the South than in any other part of this country. In 1938 there were 100,000 cases of pellagra in that portion of the country and each year this deficiency disease causes 3,000 to 4,000 deaths in the United States. As mentioned by Winters² the richest state in the South ranks lower in per capita income than the poorest state outside this region. In 1937 the average income was \$314 in the South, whereas in the rest of the country it was \$604. This same author, as well as others, believes that the nutrition problem is an economic one. It is not within our scope to dwell on the mass of information concerning the relationship of nutrition to monetary means; suffice it to say that in the detection of malnutrition in human subjects, information regarding the economic and social status is of distinct value.

Detailed and exact knowledge of the individual dietary habits serves as a useful guide in the detection of subnormal nutrition. Limitation of diet because of allergic conditions; food idiosyncracies; fads; likes, dislikes, or excesses; racial food preferences; improper training and improper feeding habits; and because of illness naturally should caution one to seek evidence of nutritional disturbances. As regards the psychologic aspect of the situation, it is interesting to note as was stated so aptly a few years ago by Brennemann³ probably never has there been a time in history that so much was known concerning just what a child should eat, yet never before has there resulted so frequently psychologic problems from trying "to make the child eat." The concern and apprehension on the part of parents at times becomes so great that internal tension in the household reaches the breaking point. The frequency of this phenomenon is said to occur inversely to the financial status. In this type of situation one should determine exactly the food consumption. When this is done, we very frequently find that the quantitative and qualitative intake is well beyond the limits which would predispose the development of deficiency disease. This knowledge in turn often leads to the solution of the entire psychologic problem.

The chief purpose of the physical examination is to detect evidence of disease, as many different pathologic conditions and endocrine abnormalities profoundly affect the nutritional state. When the physician is impressed

with the presence of "poor nutrition" routine blood and urine examinations should be advised to rule out diabetes, nephritis, anemia, et cetera. Of particular importance, however, are those conditions which are on an infectious basis. The possibility of the presence of such diseases as tuberculosis, syphilis and undulant fever usually present themselves and are relatively easily ruled out. On the other hand, a disease not so likely to be considered but which commonly affects the nutrition, yet may be difficult to diagnose, is rheumatic fever. The condition which seems to cause the most concern is the so-called "upper respiratory infection." Under modern feeding regimens we find that the infant by and large throughout the first year or two maintains an excellent nutritional state. Even though strict attention also is paid to the diet during the second and third year, the general physical condition of these children, judging from such criteria as muscle tonus, tissue turgor and texture, posture, activity, alertness, pallor, height-weight indices, et cetera, is not as good. This observation has been brought to my attention on several occasions when large numbers of young children were examined at the same time. Although it cannot be said absolutely, it appears that the fact which accounts for this change is the more frequent occurrence in this age group of repeated colds (flu, rhinitis, tonsillitis, pharyngitis, bronchitis, adenitis, and otitis). Although a complete diet with vitamin supplements, especially vitamin A, is prescribed by the physician to children with repeated colds, one seldom sees the striking results that are reported by various laboratory workers using experimental animals. Much remains to be learned in regard to the relationship of diet to infection. The recent work with the use of ultraviolet radiation for the prevention and spread of contagion awaits confirmation and if found to be effective this procedure may prove to be of practical value in decreasing the incidence of upper respiratory infections, and in turn possibly in improving the nutritional state of the child during this particular age period.

One of the purposes of the routine physical examination is to detect evidence of outspoken deficiency disease. Full blown nutritional deficiency in school children is indeed rare in this part of the country. The conditions which can be recognized by relatively simple means are:

1. Nutritional edema—protein deficiency.
2. Xerophthalmia—vitamin A deficiency.
3. Beri-beri—vitamin B₁ deficiency.
4. Pellagra—nicotinic acid (B₂ and B₆) deficiency.
5. Scurvy—vitamin C deficiency.
6. Rickets or Osteomalacia—vitamin D deficiency (also Ca & P).
7. Nutritional Anemia—iron deficiency.
8. Adolescent Goiter—iodine deficiency.

At the present time great interest is being manifested in the determination of the significance of subclinical or partial deficiencies as well as in the combined deficiency states. Many studies are being conducted along these lines but one of special interest is that being carried on by the U. S. Public Health Service in coöperation with

the Millbank Memorial Fund wherein a great variety and mass of data on a large number of individuals in various localities are being gathered. Quoting from the discussion of Boudreau¹ of this organization we are impressed with the following statements: of 4,000 children under investigation 1,000 had received no milk for two years. Seventy per cent of 75 school children were found to have lower than normal concentrations of ascorbic acid in the blood; in 48 per cent it was very low indeed, being less than 0.5 mg. per 100 cc. plasma. Nutritional edema due to lack of sufficient protein in the diet was found in 15 per cent of patients admitted to a large Georgia hospital, while 35 per cent of these patients had nutritional anemia. As time goes on, we will learn about the true significance of the mild deficiencies as a tremendous literature has accumulated the past number of years concerning various nutritional studies. The advancement in the knowledge of the vitamins has been nothing short of phenomenal. The difficulty in translating this information into the terms of human nutrition becomes quite apparent when one considers the deficiencies which are known to exist. By way of review in the following table we are presenting in outline form the fundamental requirements for normal nutrition.

THE FUNDAMENTAL REQUIREMENTS FOR

NUTRITION⁴

- I. *Water*—without which life cannot exist.
 - II. *Proteins*—22 amino acids, 10 absolutely essential—

<i>Indispensable</i>	<i>Dispensable</i>
Arginine	Alanine
Histidine	Aspartic acid
Isoleucine	Citrulline, Cystine
Leucine	Glutamic acid
Lysine	Hydroxy glutamic acid
Methionine	Glycine
Phenylalanine	Norleucine
Threonine	Proline
Tryptophane	Hydroxyproline
Valine	Serine, Tyrosine
 - III. *Carbohydrates*—to supply energy also sufficient to prevent ketosis.
 - IV. *Fats*—energy yielding; carriers of fat-soluble vitamins; phospholipids, cholesterol and related lipid compounds important in metabolism and physiologic functions. Essential nature of unsaturated fatty acids (linolic, linolenic, arachidonic acids)—possible significance in some cases of eczema.
 - V. *Minerals*—calcium, phosphorus, sodium, potassium, magnesium, chloride, sulfur, iron, and a trace of such elements as copper, iodine, manganese, zinc and cobalt.
 - VI. *Vitamins*—
 - A—beta carotene (pro-vitamin)—deficiency causes xerophthalmia and disturbance in mucus membranes.
 - B-complex—(water-soluble vitamins found in yeast or liver).
 - (1) Factors in the B-complex obtained in crystalline form:
 - B₁—thiamin—deficiency causes beri-beri.
 - B₂-(G)—riboflavin—deficiency produces cheilosis.
 - Nicotinic acid (P-P factor)—deficiency produces pellagra in human subjects and black-tongue in dogs.
 - B₃—pyridoxine (factor L, or factor Y) for prevention of acrodynia in rats; may be related in function to the unsaturated fatty acids.
 - Pantothenic acid (factor 2, filtrate factor)—found to stimulate growth of yeast and is necessary for
 - cellular respiration. It is present in widely different tissues both plant and animal and may be micro-organisms. Deficiency in chicks is characterized by dermatitis and arrest of growth.
 - Biotin—(vitamin H)—prevents egg-white-injury in rats and chicks.
 - (2) Other factors in the B-complex not obtained in crystalline form:
 - B₅—for normal nutrition and growth in pigeons.
 - B₄—for prevention of peculiar paralysis in rats and chicks.
 - B₆—for weight maintenance in pigeons.
 - Anti-gray hair factor (nutritional achromotrichia)—one of "filtrate" substances for rats and foxes.
 - Factor U—growth stimulant on chick.
 - Factor W—alkali labile, required for growth by dogs and rats.
 - Grass-juice factor—for growth in guinea pigs.
 - (3) Miscellaneous water-soluble factors:
 - Choline—prevention of fatty liver and capillary hemorrhages in kidney of rats.
 - Anti-gizzard erosion factor in chicks.
 - Chondroitin-sulphuric acid—growth factor in chicks.
 - Inositol—anti-alopecia factor—prevents loss of hair and dermatitis in mice.
 - Spectacled-eye factor in rats.
 - Anti-stomach ulcer factor (guinea pigs).
 - Kidney residue—for growth in chicks.
 - C—Ascorbic acid—important in scurvy.
 - D—Calciferol—important in rickets and osteomalacia.
 - E—Alpha tocopherol—necessary for: maintenance of normal pregnancy in rats; prevention of nutritional muscular dystrophy in *herbivora*; proper functioning of nervous system.
 - K—deficiency causes decrease in prothrombin.
 - K₁—2-methyl-3-phytyl-1, 4 naphthoquinone.
 - K₂—2-methyl-1, 4-naphthoquinone.
 - L, M, P—Miscellaneous vitamins not yet completely identified:
 - L—essential for lactation in rats.
 - M—prevents syndrome of anemia, leukopenia and weight loss in monkeys.
 - P—(citrin) said to be associated with vitamin C for maintenance of normal capillary structure.
 - VII. *Miscellaneous Nutritional Requirements*—
 - Roughage, keto-antiketogenic ratio, acid-base balance, digestibility, palatability, enzymes, hormones and pigments.
- When so many factors are responsible for the maintenance of normal nutrition, it is no wonder that the detection of abnormal nutritional states in the human subject is so difficult. The physical examination by itself will reveal relatively little exact information in the matter of the nutritional state of the child. When we see how many the factors are which are known or may be found to be important for the maintenance of normal nutrition, we can readily appreciate why short-cut methods have been and are being sought to classify children on the basis of their nutrition. We trust that future developments will bring forth some relatively easy way to determine the nutritional status, but until that time it will be necessary for us to estimate this by considering the individual from the viewpoint of the various factors mentioned in the introduction. By and large if we can supply the child with the following foods we will furnish all the food factors known to be essential for the growing child, and his chances of developing poor nutrition will, indeed, be minimal.

CONSENSUS OF AUTHORITIES ON DAILY FOOD
REQUIREMENTS FOR GROWING CHILD

Protein—2 gm. per kg. body weight.
Fat and carbohydrate—sufficient to meet caloric needs.
Calcium—1 gm.
Phosphorus—1 gm.
Iron—16 mg.

Vitamins:

A—7,000 I. U.
D—700 I. U.
B₁—1 mg.
Riboflavin—2 mg.
C—65 mg.
Nicotinic acid—15 mg.

COMPOSITION OF DAILY DIET WHICH SATISFIES BASIC
NUTRITIONAL NEEDS OF GROWING CHILD

Milk— $\frac{3}{4}$ to 1 quart.
Egg—1.
Vegetables—2 or more servings (1 raw, 1 pigmented).
Fruits—2 or more servings (1 fresh).
Meat—fresh, lean, or fish.

Butter—2 tablespoons or more.

Calories—sufficient to meet requirements (bread and cereals).

Cod Liver Oil—1 teaspoon (or equivalent in vitamins A and D).

Salt—iodized.

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A Clinical Evaluation of Beta Lactose as a Prelacteal Feeding*

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LOSS of weight in the newborn infant is generally accepted as an unavoidable occurrence. Evidence of this belief is manifested by the commonly applied term "physiological weight loss." It is well known that the newborn infant undergoes such a loss shortly after birth. Sanford¹ states that this amounts to from 5 to 8 per cent of the original birth weight. It is usually regained in ten days.² The initial weight reduction is attributed to several natural and inevitable factors of the postnatal period. These factors are the loss of vernix caseosa, vomitus, the excretion of meconium and urine, and a deficiency of food and water.³ Of these, clinical observers have found that the early inadequacy of food is by far the greatest contributing factor. This has been borne out by observations on members of the animal kingdom. Immediately after birth, animals seek the breast, and nurse continuously, interrupted only by sleep. Their food intake is at once adequate, and the loss in weight is truly physiologic, consisting only of amniotic fluid, hair, skin, urine and meconium. As a

consequence, changes in weight observed in animals are not comparable to those in man. In the former, the loss represents an irreducible minimum which is usually not more than one day's duration. When compared phylogenetically, the loss of weight in the newborn infant is unnecessary and may easily be reduced.

In recent years, the question of the necessity and wisdom of attempting to prevent the initial weight loss has received increasing attention. The fact that the milk supply is delayed for two to four days is no longer universally accepted as evidence that the newborn baby is not capable of digesting small amounts of suitable foods. Loss of weight in the newborn is, in the main, a result of starvation. During an infant's transition to his postnatal environment, manifestations such as icterus, impetigo, gastro-intestinal upsets, and inanition fever may be greatly aggravated if the state of starvation is allowed to persist. As a result, attempts have been made recently to eliminate the early period of inadequate food intake by offering various prelacteal feedings.

The use of such feedings is not without danger. Dilute

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milk formulae have proved to be unsuccessful, and the objection has been raised that an allergic state may be created. Kugelmass¹ advocates the administration of a solution consisting of 6 per cent gelatin, 3 per cent dextrose, and 0.5 per cent sodium chloride; however, Senn² calls attention to the danger of edema developing from the use of such a solution. Edema has also been observed by Krost and Epstein³ with the prelacteal administration of a dextri-maltose solution.

At the present time the majority of the large institutions or hospitals employ different types of sugar solutions. Of these, lactose is probably the most popular and the most effective. Good results have been reported by Herrman⁷ and later by Adair and Stewart⁸ with the use of a 10 per cent lactose solution. The fear of the danger of diarrhea from lactose fermentation in the intestine is without foundation. It is true that lactose renders the intestinal contents acid;⁹ however, according to Gerstley¹⁰ this acidity does not lead to clinical diarrhea. The acid stools found in diarrhea are not dependent upon the lactose in the diet but rather upon a faulty mechanism of absorption and peristalsis.

Recently, growing attention has been given to beta lactose as a prelacteal feeding. It is listed in "New and Nonofficial Remedies"¹¹ as an isomer of lactose. It is sweeter and more soluble than the latter. The chemical formula is $C_{12}H_{22}O_{11}$. Most commonly it is employed as a 5 per cent solution. Eder and Bakewell¹² advocate the further addition of sodium citrate. They believe that some degree of acidosis frequently develops in the newborn infant and that inanition fever is actually a manifestation of an acute acidosis. The addition of an alkali is thus thought to be beneficial in preventing such a state. They find that the use of this feeding during the prelacteal period results in a reduction of the initial weight loss, fewer cases of inanition fever, more vigorous nursing, and fewer instances of icterus. Smyth and Hurwitz¹³ call attention to the fact that inasmuch as hypochlorhydria is a frequent finding in newly born infants, the addition of an alkali is contra-indicated. Schorer and Laffon,¹⁴ however, in comparing several prelacteal feedings in 962 infants, find that beta lactose-sodium solution is the most effective. Epstein and Thompson¹⁵ also confirm the superiority of this feeding.

PLAN OF PROCEDURE

In an attempt to evaluate such a feeding during the prelacteal period, we have analyzed the records of 400 infants born at the Minneapolis General Hospital. This is a large municipal hospital in which all full term babies are given the same care. The 400 infants selected for study were divided into two equal groups. There were 100 males and 100 females in each group. One group was kept on the following routine feeding schedule. All the full term babies were given a rest interval of sixteen hours after birth before they were put to breast. They were not permitted to nurse for longer than 5 minutes at each feeding during the first twenty-four hours. The length of the nursing period was then gradually increased to a maximum of 10 minutes on each breast.

The infants were nursed every four hours for five successive periods of the twenty-four hours, starting at 5:00 in the morning. At the sixth period (night period), they were given sterile water, but did not go to breast. During the first four days, they were offered sterile water after every feeding. The amount of water taken was recorded on their charts. After the fourth day this water was given at the half-way interval between feedings.

The infants were weighed daily and the weights recorded on their respective charts. If the initial weight loss exceeded 10 per cent of the birth weight, they were weighed before and after each feeding to determine the amount of breast milk received. Likewise, if the initial loss, regardless of the amount, was not regained by the fifth day or if there was no gain in weight for two consecutive days, then "ac" and "pc" weighings were deemed necessary. This enabled the staff to determine the necessity of complemental feedings.

Group two was given exactly the same attention with the exception that a prelacteal feeding was substituted for water during the first three days. This feeding was a 5 per cent beta lactose solution to which sodium citrate was added in the proportion of 5 grains to each 2 ounces.

Since, as recently shown by Cole,¹⁶ several factors of delivery may influence the weight curve of the baby, only those infants born of mothers having spontaneous uncomplicated deliveries were selected. In no instance was an oxytocic drug given prior to the birth of the baby, nor was sedation employed within four hours of delivery. All infants selected weighed between 3,000 and 4,000 grams at birth. Half of the infants of each group were born of primiparous and half of multiparous mothers. In studying the babies selected, particular attention was focused on the development of icterus, the weight curve, gastro-intestinal upsets, and inanition fever.

RESULTS

The Initial Weight Loss and the Rate of Recovery. The figures plotted in chart 1 indicate the weights of the two groups in relation to their original birth weights. The percentages given are average figures of the total number of infants in each group. Since most babies were discharged from the hospital on the eighth day, such percentages were computed only through that day. The curve of the infants given the beta lactose-sodium citrate solution at first glance seems to be more impressive than that of those offered water. A careful analysis, however, reveals that although there was a slight difference in the initial weight loss, the rate of recovery was more rapid if anything in the control group. The average birth weight of the infants given beta lactose-sodium citrate solution was 3,414 grams and the discharge weight 3,428 grams, representing a gain of 14 grams or 0.41 per cent over the birth weight. The maximum weight loss was 3.9 per cent. In the control group, the average birth weight was 3,454 grams and the weight on the day of discharge 3,419 grams, a loss of 35 grams or 1 per cent of the original weight. The maximum weight loss in this group was 5.8 per cent. In

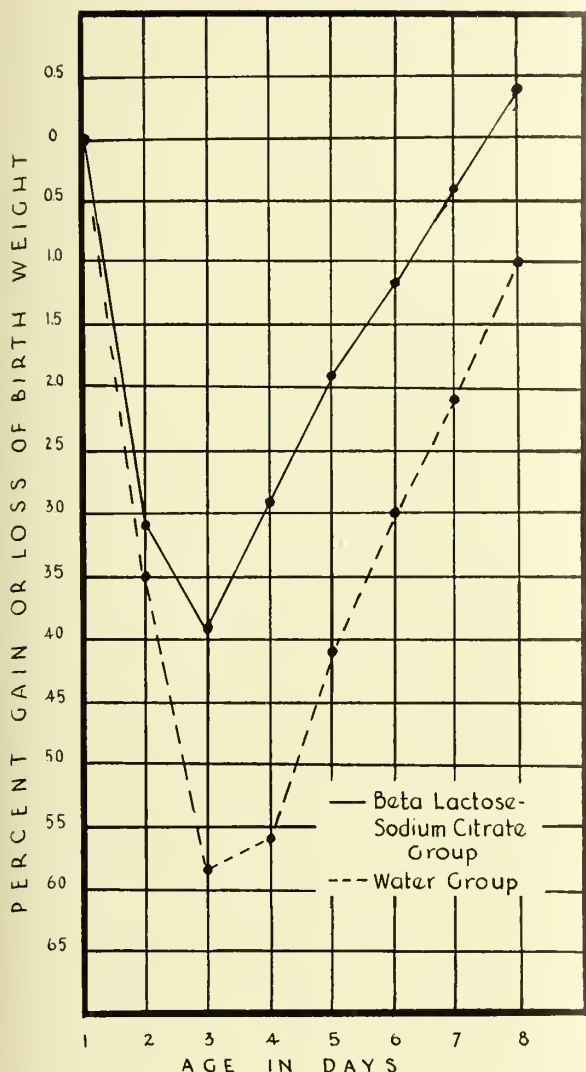


Fig. 1. The comparison of the initial weight loss and subsequent gain in the Beta Lactose and Control groups of infants.

both series, this occurred on the third day. The initial weight loss was thus somewhat greater in the control group of infants. In studying the rate of recovery, however, it will be noted that with the exception of the first day (fourth day of life), the rate was greater every day in the infants given water. From this we may conclude that the administration of beta lactose-sodium citrate solution was somewhat effective in reducing the initial weight loss but exerted no influence on the rate of recovery from this loss. This may almost wholly be explained when we compare the daily intakes of the babies of the two groups.

The average amount of beta lactose-sodium citrate solution taken during the three day period was 262 cc. as compared to only 149 cc. of water in the control group of infants. This represents a difference of 113 cc. of fluid, which alone may easily account for the difference in the maximum weight losses. The fact that beta lactose-sodium citrate solution was taken in larger

amounts than water, however, is good evidence of its "acceptability". The difference observed in the initial weight losses of the two groups may thus be explained in part or possibly entirely on the observation that the prelacteal feeding was taken much more readily than water.

TABLE I.
The Percentage of Infants in Both Groups Regaining Their Original Birth Weights During Their Hospital Stay

Age in Days	Percentage of Beta Lactose-Sodium Citrate Group Regaining Birth Weight	Percentage of Water Group Regaining Birth Weight
1	1.0	0.
2	1.0	0.
3	7.0	0.
4	14.5	2.5
5	24.5	7.5
6	33.0	14.5
7	46.5	27.0
8	60.0	38.5

Table I illustrates the percentage of babies in each group who regained their birth weights before discharge from the hospital. Since the maximum loss of weight was less in the infants given the beta lactose-sodium citrate solution, it was not surprising to find that a greater percentage of them regained their birth weights before leaving the hospital. The percentage in this group that regained their original weights was 24.5 by the fifth and 60 by the eighth day. In the control group, 14.5 per cent regained their birth weights by the fifth and 38.5 per cent by the eighth day.

Inanition Fever. Fever was more commonly encountered in the control group of infants. There were 27 cases of dehydration fever in this group as compared to only 9 in those given the beta lactose-sodium citrate solution. This difference is of statistical significance. If the use of such a prelacteal feeding will diminish the incidence of inanition fever by two-thirds, then it is truly of value.

Gastro-intestinal Upsets and Icterus. Gastro-intestinal upsets were rare in both groups. In no instance was vomiting observed. The stools were of normal appearance and consistency in all infants studied and no persistent diarrhea was encountered. Two infants of the control group, however, suffered a very brief period of diarrhea. Icterus of the physiological type was observed in 6 of the infants given the prelacteal feeding and in 12 of the control group. This difference is too small to be of any significance.

Conditioning for or Against Successful Breast Feeding. In general, it was noted that the babies given the prelacteal feeding were less apathetic and nursed more vigorously. The number of these infants requiring partial or total artificial feedings was 7 as compared to 5 of the control group. Concerning the administration of the higher caloric prelacteal feedings, Sanford¹⁷ contends that there is a reduction in the number of babies that receive a sufficient supply of breast milk. Schorer and Laffoon¹⁴ found this was not true with the use of lactose solutions. In our series of cases it can be said that there

was no evidence that beta lactose-sodium citrate solution conditions the baby either for or against the breast.

SUMMARY AND CONCLUSIONS

The prelacteal administration of a beta lactose-sodium citrate solution to 200 infants reduced the initial weight loss as compared to a like number of control infants. This reduction was, however, not large enough to be of any practical importance. The rate of weight recovery was not accelerated by the use of this solution. There was no significant influence on the incidence of gastrointestinal upsets or icterus, nor was there any evidence that the use of this prelacteal feeding conditions the baby either for or against the breast. The one observation that justifies the use of beta lactose-sodium citrate solution as a prelacteal feeding was the lowered incidence of inanition fever, the explanation of which lies in the fact that such a solution is more acceptable to the infant than water, resulting in a greater fluid intake.

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Dilantin Sodium Therapy in Epileptiform Seizures of Children*

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DILANTIN sodium (sodium diphenylhydantoinate) was introduced clinically as an anticonvulsant drug in September, 1938, by Merritt and Putnam.¹ Because no drug previously used in the treatment of epilepsy was thoroughly satisfactory, these investigators tested the effects of a series of compounds on electrically stimulated convulsions in cats. In May, 1938, they published the results of these experiments,² which indicated that diphenylhydantoin would raise the convulsive threshold higher than phenobarbital without producing the soporific effect of the latter. They employed dilantin in 142 cases of convulsive disorder and reported benefit in a high percentage of these patients.¹

Since October, 1938, dilantin sodium has been given to many of the epileptic children attending the Pediatric Out Patient Department of the University of Minnesota Hospital. The series of cases on which this report is based, though small, is of interest because it comprises only children and because several of the patients have received the drug continuously for two years or more.

METHOD AND RESULTS OF TREATMENT

All epileptic patients admitted to this clinic are routinely placed on a water restriction diet.³ This diet is calculated to limit the water intake to 900 cc. per 24 hours, including the total water content of the food

and a small allowance of drinking water. The diligence with which the diet is followed is judged by determining the specific gravity of the urine at each clinic visit, a reading of 1.025 to 1.030 being regarded as an indication of a satisfactory degree of dehydration.⁴

In addition, some medication is employed if necessary, including only phenobarbital and dilantin sodium in the present series. At the outset of this study, the latter drug was given to patients who did not respond satisfactorily to other measures, but as new cases were admitted many of these received dilantin at once.

The dosage ranged from 0.2 gm. to 0.4 gm. per day, depending on the age of the child and on individual tolerance. Merritt and Putnam¹ recommended 0.1 to 0.2 gm. of dilantin as the initial dose for children under 6, and advised increasing this to 0.4 gm. per day if necessary. They stated that older children could be given 0.3 gm. per day initially and gave 0.6 gm. as the maximum daily dose for this group. Robinson and Osgood⁵ used as high as 0.9 gm. per day in treating adults but concluded that 0.6 gm. should be the maximum dose. In our series most of the younger children could not tolerate more than 0.2 gm. of dilantin per day without unpleasant toxic effects and a few of the older patients were unable to take over 0.3 gm. per day. We found it advisable to begin with 0.1 gm. in children under 4 years of age, 0.2 gm. in those between 4 and 10,

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and 0.3 gm. in those above 10. In all cases the daily amount was administered in two or three equally divided doses. If no toxic symptoms resulted, the dosage was increased up to the limit of tolerance, or until improvement was noted, and maintained at that level.

In evaluating results in this study we compared the average number of seizures per month during the period of dilantin administration with the number occurring during the immediately preceding period. Some of the patients had been receiving various types of dietary and sedative therapy, while others had had no treatment. Therefore no attempt was made to compare the efficiency of dilantin sodium with that of any other agent.

The 34 children treated with dilantin sodium ranged in age from 5 months to 16 years. Of these 24 had only grand mal attacks, 2 had only petit mal, and in the remaining 8 patients, seizures of both types occurred. The drug was used over periods of from 1 to 28 months; two-thirds of the cases were followed for one year or more and one-fifth of them for two years or more.

The results obtained are tabulated in the accompanying table. Of 34 patients, 3 (9 per cent) experienced complete cessation of seizures, 19 (56 per cent) were improved—14 markedly, 5 moderately—and the remaining 12 (35 per cent) were not benefited. In many the attacks became milder. These figures (i. e. 65 per cent of favorable results) are comparable to experiences of most other writers on the subject.^{5,6,7,8,9,10,11} However, some observers have reported a higher percentage of complete remissions than we have been able to obtain.^{1,7,9,11,12.}

In 23 of the 34 children dilantin sodium was used continuously for a year or more. In all but one of these who were improved by its use, the benefit was maintained throughout the period of observation without any increase in dosage, indicating that in general, children do not acquire a tolerance for the drug. Most of the patients felt no ill effect from the medication.

It is of interest that in general the patients with the most frequent attacks were those most benefited, while children with infrequent attacks were usually improved little if at all. Our largest proportion of failures was among those who experienced only a few seizures per year. Merritt and Putnam¹³ made the same observation and suggested giving these patients more than the minimum of dilantin. Most of our patients received as much of the drug as they could tolerate but there were a few who might have been able to take larger amounts.

In 11 cases, phenobarbital was used in conjunction with dilantin; in 4 of them, the combination was beneficial, while in the other 7 no improvement was noted. These two drugs have been used together by Cohen et al¹⁴ who suggest that they have a synergistic action. Robinson and Osgood⁵ reported that in many cases, better results were obtained with the combination than by using either drug alone. We gave phenobarbital with dilantin sodium to patients whose response to the latter medication was unsatisfactory and enough of these cases improved to make us feel that the combination was worth a trial when other methods failed.

Since this series consists almost entirely of grand mal cases, we were unable to compare the effectiveness of dilantin in grand mal and petit mal. However, it is of interest that, whereas Merritt and Putnam¹² had better success with grand mal, two of our three complete remissions occurred in patients with petit mal.

TOXIC EFFECTS

No patient was entirely unable to tolerate dilantin sodium. The common toxic symptoms produced by doses in excess of an individual's tolerance were vertigo and ataxia. Vertigo occurred in 11 (32 per cent) of our patients; in 2 it lasted for only a few days and was relatively mild, but in the remaining 9 it was sufficiently severe to limit the dose of drug administered. In 4 of these 9, vertigo was accompanied by ataxia.

In 10 (29 per cent) of the cases, hypertrophy of the gums was noted. This was most marked about the incisor and canine teeth and occurred in either the upper or lower jaw alone, or in both. Merritt and Putnam¹³ reported this complication in only 6 per cent of their patients. Kimball reported that low blood ascorbic acid levels were found in individuals showing this hypertrophy of the gums and with this in mind we administered ascorbic acid 50 mg. daily to 4 of our patients for several months without effect. The hypertrophy is apparently progressive at first and then remains stationary. As it causes no discomfort, this complication is not a contra-indication to the use of dilantin nor does it necessitate reduction of the dose.

One patient developed nausea and vomiting. One had urticaria which appeared after the drug was given for one week, then disappeared and recurred on two occasions almost a year later. One patient complained of sleepiness while taking 0.3 gm. of dilantin per day, but this disappeared when the dose was reduced to 0.2 gm.

SUMMARY AND CONCLUSIONS

1. Dilantin sodium was administered to 34 epileptic children over periods ranging from 1 month to 28 months.
2. The proportion of patients showing improvement was 65 per cent. Only 9 per cent became completely free of attacks. The drug was beneficial more often in the children with frequent attacks than in those with infrequent attacks.
3. Dilantin possesses the advantage of anticonvulsant action unaccompanied by a soporific effect.
4. Toxic manifestations are not serious, and, when they are troublesome, can be controlled by a reduction of dosage.
5. Dilantin sodium alone, or in combination with other measures, is a valuable adjunct in the treatment of epilepsy in children.

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Pt.	Age	Duration of Attacks	Average Frequency of Attacks before Use of Dilantin	Type of Attacks petit or grand mal	Daily Dose of Dilantin	Months of Use of Dilantin	Results Average Frequency of Attacks with Dilantin
E. St. I.	3 years	1 month	300 a month	petit	0.2gm.	2½	complete cessation
D. L.	3 years	3 months	300 a month	petit	0.2gm.	1½	no improvement
J. O.	7 years	3 years	200 a month	petit, occ. grand	0.3gm. & phenobarbital 0.03gm.	26	7 a month
D. N.	3 years	6 months	150 a month	petit, occ. grand	0.2gm.	1	no improvement
D. M.	7 years	6 years	120 a month	grand & petit	0.2gm.	16	2 petit a year
D. D.	5 months	1 month	100 a month	grand	0.2gm.	2	no improvement
L. B.	12 years	5 months	90 a month	grand	0.3gm.	12	17 a month
D. R.	9 years	3 years	60 a month	grand	0.3gm. & phenobarbital 0.03gm.	24	3 a month
J. P.	4 years	2 years	60 a month	grand	0.2gm.	9	2 a month first 6 months then relapse
R. T.	9 years	6 years	60 a month	grand	0.4gm.	12	2 a month first 2 months then gradual relapse
K. K.	12 years	8 years	50 a month	grand	0.3gm.	24	3 a month
C. C.	13 years	8 years	30 a month	grand	0.3gm. & phenobarbital 0.06gm.	16	no improvement
S. A. C.	7 years	2 months	30 a month	petit & grand	0.2gm.	8	complete cessation
M. J. J.	11 years	9 years	10 a month	grand	0.3gm.	6	4 a year
R. R.	6 years	life	6 a month	grand	0.2gm. & phenobarbital 0.2gm.	15	no improvement
D. L.	15 years	14 years	5 a month	grand & petit	0.3gm. & phenobarbital 0.03gm.	14	10 a year
R. H.	7 years	life	4 a month	grand	0.3gm.	8	1 a year
P. H.	8 years	5 months	4 a month	grand	0.3gm.	20	same for 3 months then complete cessation
M. E. J.	7 years	5 months	4 a month	grand	0.3gm.	12	2 a year
K. T.	5 years	4 years	4 a month	grand	0.2gm.	7	2 a month, milder
R. D.	14 years	2½ years	3 a month	grand	0.4gm. & phenobarbital 0.03gm.	24	6 a year, milder
R. C.	11 years	9 years	3 a month	grand & petit	0.3gm.	12	5 a year
A. L. C.	17 months	7 months	3 a month	grand	0.2gm.	20	4 a year, milder
S. B.	15 years	7 months	2 a month	grand	0.4gm. & phenobarbital 0.15gm.	24	no improvement
P. M.	11 years	6 years	2 a month	grand	0.4gm.	24	no improvement
A. R.	3 years	life	1 a month	grand	0.2gm.	20	3 a year
D. M.	14 years	life	9 a year	grand	0.4gm. & phenobarbital 0.06gm.	19	no improvement
C. M.	14 years	2 years	7 a year	grand	0.3gm.	28	same for 12 months then complete cessation
M. H.	14 years	2 years	7 a year	grand & petit	0.3gm.	12	no improvement
M. B.	12 years	1 year	4 a year	grand	0.2gm.	10	4 a year, milder
A. F.	16 years	2 years	3 a year	grand	0.2gm.	7	complete cessation
C. P.	8 years	4 years	3 a year	grand, occ. petit	0.2gm. & phenobarbital 0.03gm.	12	no improvement
J. R.	16 years	7 years	3 a year	grand	0.4gm. & phenobarbital	22	no improvement
I. D.	12 years	life	2 a year	grand	0.2gm. & phenobarbital 0.03gm.	17	no improvement

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Easing Convalescence

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DURING the past few years, there has been a steadily growing interest in the patient as a person and his needs beyond the purely physical. The mental attitudes and reactions of the sick individual have a definite effect on his response to procedures directed toward improving the physical condition. This is particularly true during the convalescent period. While the advances in methods of treatment for many illnesses have altered the course of medical practice in recent years, the management of the convalescent period remains a difficult problem. In the past, the busy practitioner has seldom felt any keen responsibility for this period; his primary interest has been in the purely physical aspects of the disease.

Problems of convalescence can be greatly reduced if there is conscious planning to improve the mental attitude of the patient during this time. In this article, we will consider chiefly the management of children during convalescence, although the fundamental principles are equally applicable to adults.

It requires a personal experience of prolonged illness to appreciate how long a day can be for an unoccupied invalid. Trivial things that would ordinarily be too insignificant to notice become mileposts about which the day is built. Mealtimes and the taking of temperature represent important breaks in the monotony. Convalescence will become less tedious if there is a definite plan to follow that dispels boredom. A comparison of the reactions of patients in the hospital before and after the inauguration of planned programs should be convincing to all who doubt the value of play therapy, occupational therapy, and even school work on the wards. Little along comparable lines has been done with the convalescent child in his own home, largely because the physician has not recognized the possibilities of such a program as an aid to his treatment. While a planned daily schedule is most applicable for long illness such as one expects in chorea, orthopedic, cardiac, chest, and kidney conditions, it can be used to equal advantage in shorter convalescent periods following pneumonia or any equally debilitating disease.

The idle child is prone to be discontented, whining, and fretful, and creates many unnecessary problems of nursing. The constant demand for attention from the one responsible for his care, be it the mother or a nurse, tries the patience and causes irritability, thus adding to the strain of care. If the child is left alone, the demands for attention increase, with restlessness that uses up valuable energy. A planned routine that will permit the mother to go about her household duties with a minimum of interruption is in itself a strong recommendation. It provides new interests for the child and makes him think less about himself and his illness, for

it breaks up long, dull periods into short spells, each with a new diversion. If the daily schedule is presented to the child and the mother by the physician, as part of the medical program, the chances for success of the plan are increased, for it becomes a challenge to the child to cooperate.

The basic divisions of an organized daily schedule naturally center about mealtimes. Between breakfast and the morning care of bathing and tidying up the bed, the time can be devoted to reading, drawing, cutting out pictures, or similar "minor activities." After morning care should come the period of "major activity" of the forenoon. This is a good time to devote to occupational therapy while the child is fresh. It is a period of construction. For the child who requires bed rest but who can be propped up in bed, a bed table that is simply but strongly constructed is a valuable asset. It is useful not only for serving meals, but it also becomes a work bench under which a folded sheet can be spread to catch debris and protect the bedding. A bed table 10 inches wide and 30 inches long, with legs 9 inches high, is a satisfactory size and can be constructed for a small amount, stored in a small space, and used repeatedly for other patients. Legs that are hinged and can be locked firmly in place are most satisfactory.

The range of occupational interests is wide. Aeroplane, ship, and train models can be obtained in a wide variety of complexity. Soap carving with a small electrician's screwdriver can be quite entertaining. Leather work, which can be obtained from craft shops that supply material for Scout projects, and sponge rubber and plastic toys are bound to create interest. Bead work on looms obtainable in large and small sizes, depending upon the age of the child, proves fascinating. Rings created from the handles of discarded toothbrushes softened with acetone for ease in molding are particularly appealing to adolescents. Scrap-books, cutouts, paper weaving and card darning serve a useful purpose in keeping younger children contented. Most of these activities are not messy nor strenuous.

The interest in these projects may be desultory at first. There will be an expected demand for attention of the mother, for the convalescent child usually does not give up his invalid role without a struggle. However, with some patience and persistence on the mother's part in insisting that she has duties elsewhere, the child learns to be more independent and content to be alone. As he sees some degree of progress in his handiwork and derives satisfaction in seeing it grow, it is easy for him to lose himself in the daydreams that nature finds so valuable an asset in promoting recovery. Fanciful adventure that can go along with concrete construction is a more healthy attitude for recovery than that of the discontented, fretful child. If at all possible, the child

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should be encouraged to work alone during this period, for it teaches independence and interest; occasional "look ins" and complimentary remarks to encourage him are helpful. It is wise to plan this activity for a definite period of approximately an hour, and it should be terminated before interest lags; otherwise the program will wear itself out. It is probably wise to start with a shorter session, twenty minutes or half an hour, and gradually increase it to an hour. A useful means of termination is supplying mid-morning nourishment in the form of fruit juice or milk and crackers, which can be prepared at breakfast time and set aside.

The time from mid-morning to noon may be anticipated to be a difficult one in the convalescent day. The effort of creative purpose has been used and the patient is fatigued, even though the expenditure of physical energy has been limited. This is a useful time to fall back on books, picture puzzles, or games that can be played alone. Again it is wise to train the child early in convalescence to spend this time alone. In the average household, the preparation of the mid-day meal for the rest of the family demands attention away from the patient. In the beginning the child will try every device at his command to retain attention on himself, but the noon meal, the high spot of the day, should represent the reward for his willingness to stay alone.

Rest in a darkened room for an hour or an hour and a half should be encouraged in early afternoon. This should also afford the mother opportunity for relaxation. The rest period should be followed by more constructive work. While the project used in the morning may be used again if the child is particularly interested in it, it is often valuable to use an entirely different project so that interest does not lag. The duration of interest in the afternoon will frequently be shorter than that of the morning, particularly if the child has become accustomed to constant attention and companionship, for he has become tired of his own company. This time can be filled with reading aloud, playing games, and similar activities.

Radio programs designed for children are usually available in the late afternoon and early evening. The radio during convalescence should be limited to selected programs definitely planned to fit into the schedule. Continuous, aimless use of the radio is to be discouraged. The radio used during the late afternoon permits the mother to prepare the evening meal without interruption.

The early evening should offer some diversion through such games as Chinese or regular checkers, dominoes, or simple card games that can be played quietly. During this time, those members of the family who have been absent at school or work during the day can bring new faces and interest into the sick room.

Books for the younger convalescent who cannot read or reads haltingly should have plenty of illustrations. Out-of-date travel folders, which can usually be obtained at any railway station or travel agency, offer visual stimulation to the convalescent. For older children with reasonable reading skill, a wide array of interesting books can usually be suggested by the librarian of any public library. Because the span of intellectual interest is decreased at this time, even with adults, short stories that can be completed in about twenty minutes are more useful during the convalescent period than the book-length story.

The convalescent stage is one of transition from illness to health. Every effort should be directed toward complete rehabilitation from which every residual of invalidism is sheared. It is important that the patient does not retain his play for attention through physical complaints. Hap-hazard, ill-defined routines during convalescence perpetuate bad mental attitudes that retard recovery. The organization of a daily routine with the mother and the patient, takes but a few moments and may be time well spent. Convalescence loses many of its greatest handicaps through the creation of new and useful interests that speed recovery. The burden of care on the mother is lightened, for her energies are not constantly demanded by a fretful, discontented child.

The physician's visits assume a different atmosphere if there is a preliminary inspection of the handiwork that has been accomplished. Praise of effort gives renewed enthusiasm to continue. A little well-directed praise will often allay apprehension centering about painful procedures that were formerly upsetting. The desire to work for additional praise on future visits may divert introspection of anticipated discomfort into more cheerful channels.

Physicians with heavy schedules and interested in the progress of physical symptoms are apt to overlook the emotional needs of the patient. A simple, routine organization of the day that creates new interests and diversions away from selfish introspection can work wonders in speeding convalescence.

Essential Hypertension*

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DIFFERENCE of opinion exists as to the exact meaning of the term "essential hypertension". It seems the phrase is used rather loosely by some; others use it for a more exact group of cases. The 1924 Dorland dictionary gives this definition: "It is high blood pressure without the presence of any discoverable pathological lesion." Twelve years later the same dictionary gives this definition: "High blood pressure without antecedent inflammatory disease of the kidney or urinary tract." Christian, in *Oxford Medicine*, December 15, 1929, states: "By essential vascular hypertension we understand high blood pressure not obviously secondary to any demonstrable cause, and we distinguish it from any high blood pressure that gradually develops in chronic nephritis or quickly develops in acute nephritis, apparently in close relationship to renal insufficiency, in this sense a secondary hypertension, while the essential vascular hypertension might be considered a primary condition."

Albutt calls it "hyperpiesis". Schroeder and Steele in November, 1939, made a classification of their patients with essential hypertension. They quote Fishberg as stating, "Essential hypertension is almost certainly a collective concept for a number of conditions having in common the positive characteristic of arterial hypertension and the negative one of absence of primary renal disease." Schroeder and Steele then immediately proceed to divide their cases of essential hypertension into four symptomatic categories, the main one of which they classify as "renal". They consider that there may be many demonstrable findings of renal disorder but as long as there is not "renal failure," the cases are eligible for inclusion under the term essential hypertension. Similarly, they discuss the other three groups, the neurogenic, endocrine and vascular groups. Some authors emphasize the necessity of a high diastolic pressure as well as a high systolic pressure, whereas other authors either fail to mention the diastolic pressure or even state that the diastolic pressure is inclined to be low. Thus, different authors vary in their concepts of the term essential hypertension. It seems to be a rather loose term and possibly it is one which will be displaced as our knowledge of the causes of disease processes improves.

Smith, Weiss, Lillie and Konzelmann divide arteriosclerosis into two main categories: (1) the atherosclerotic, that is the senile sclerotic with changes of the aorta and its main branches; and (2) essential hypertension which is a disorder of the arterioles and which begins with vascular spasms and ends with hypertensive vascular disease. They do not exactly define the limits of this last group at either end. In fact, they assert that essential hypertension is not usually precipitous but be-

gins insidiously. Therefore, its exact origin is problematical, and it is usually found only accidentally.

If essential hypertension is a disorder primarily of the arterioles, certainly we have in the eye-grounds a marvelous means of following the visible changes, because here we can see the blood vessels in their branches until they are almost capillaries.

Spasm of the arterioles seems to be the principal cause of essential hypertension. Occasionally one can see spasms of the arterioles in the background of the eye. These may be frequently seen in cases of eclampsia. It is probable that the visual phenomena in migraine, the scintillating scotomas, or the quadrant or hemianopic or scotoma-like defects of the field are usually due to vascular spasms. If the spasms do not last for an appreciable time, and they usually do not, stasis does not occur long enough to allow the blood to clot in the capillaries. Consequently, when the blood flow resumes, the function of the organ returns. Spasms may be of small branches or very local in one branch or may indeed involve the entire central artery of the retina. If such a case is seen with the ophthalmoscope during the spasm, the part supplied by the spastic artery is somewhat pale. If the spasm lasts for an appreciable time, when it relaxes, an edema of the tissue often occurs. This also is temporary and is similar to edema occurring in other tissues following spasm.

Frequent spasms cause hypertrophy of the muscle. When a vessel wall becomes hypertrophied the lumen is narrowed and in order that the former amount of blood reach the tissue through that lumen, it must be under greater pressure. Therefore, when changes have actually taken place in the walls of the arterioles, the left heart must work harder, and the blood pressure must be raised. Conversely, if the pressure is high the vessel walls must be strong. If in the course of essential hypertension we have a very sudden increase in the pressure, weak spots may be found in apparently normal walls and small hemorrhages occur.

As for the ophthalmologic findings: in the first place the visible changes are practically all confined to the eye-grounds, although in the acute stages occasionally edema of the eyelids is present. If we consider the term in its strictest sense as meaning high blood pressure without any observable associated organic lesion, then in the early stages there are practically no abnormal findings in the eye-grounds. Later, or if we use the term with its larger meaning, changes can be seen that are exceedingly interesting and important.

In order to recognize vascular changes it is absolutely necessary first of all for us to recognize the normal picture. One essential in the proper evaluation of the fundus findings is a good dilatation of the pupils; erroneous conclusions are often the result of an attempt to study

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the eye-grounds through small pupils. A vessel may appear somewhat different when observed through one part of the pupil than through another part. Also, a dark room is required, as is an unhurried attention.

I briefly mention the anatomy of the eye-grounds. The optic nerve head averages about $1\frac{1}{2}$ mm. in diameter. The central artery of the retina at its entrance through the nerve head is approximately $1/10$ mm. in diameter. The veins are slightly larger than the arteries. Wagner considers that all the arteries in the fundus are arterioles.

The retina is a part of the brain, as it is derived from neuro-ectoderm. The blood vessels are mesodermal tissue and they are foreign bodies in the brain and the retina. (Weigert). Therefore, they are separated from brain tissue by sheaths of connective tissue (mesodermal) and glia (neuro-ectodermal). The sheaths are larger for the larger vessels, and gradually diminish until they are lost in the capillaries, whose walls are only a single layer of endothelial cells. The vessels in the retina lie on the most anterior layer and only their finer branches penetrate into the retinal tissue. The arterioles are end vessels; they do not anastomose. Normally, an arteriole does not cross another arteriole. Consequently when we see vessels crossing in the background of the eye, one must be an arteriole and the other must be a venule. Normally the arteriole is a little redder and of smaller caliber, the relationship being as three is to four. The sheaths of the vessels where they cross unite to form a common sheath. This normally gives stability, but when there is a beating pressure or tug upon one of the vessels as in arterial hypertension, it is conceivable and demonstrable that the other suffers as a result of the hypertrophy.

Normally, the arterioles of the retina are composed of intima, elastic elements, muscularis and adventitia. The venules have no muscular coat, but are rich in elastic elements. The connective tissue and elastic fibers tend to increase with age. Normally the vessel sheaths, the so-called perivascularis, is transparent except upon and close to the optic disc. We see the blood column, not the blood vessel. Consequently, at the crossings one is able to see the column of blood in the lower vessel through the sheath of the overlying vessel. But wherever the perivascularis has been thickened, or tissue has been laid down to strengthen it, its transparency is lessened and the visibility of the underlying blood column is interfered with. This is called loss of transparency. As this perivascularis is fortified at the crossings, it tends to contract and pull the weaker member somewhat out of its normal position. This is called "banking" and the venule is usually the "banked" member. Occasionally this increased tissue about the vessel also compresses or collapses the weaker member, the venule.

The arteriolar spasm and the hypertrophy of the muscularis cause irregularities in the lumen of the arterioles so that the blood column is not of a uniformly diminishing width as it is traced outward, but it varies. If the variation in the size of the blood column is temporary, then one may be assured that the condition is a spastic

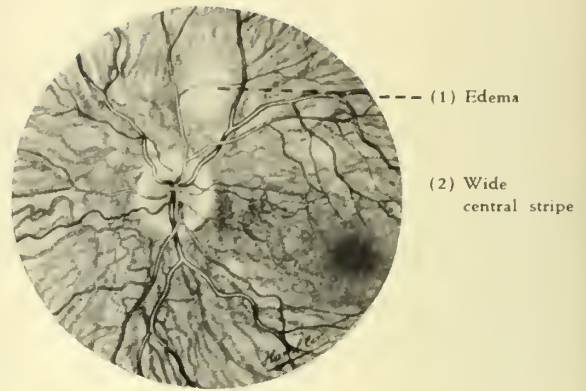


Fig. 1.

one. The more permanent the irregularity the more certainly it is due to organic changes in the vessel wall, either in the muscularis or in the perivascularis or both. In the very fine arterioles, particularly around the yellow spot, the blood pressure may cause the vessels to become quite tortuous because the finer the arteriole the less the perivascular supporting tissue.

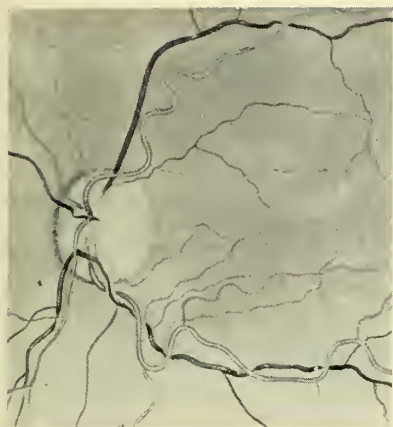
In the larger vessels the reflex stripe in the center of the vessel is simply a highlight from the vessel wall. Whenever the muscular wall of the vessel itself is thicker and larger, this central reflex stripe is broadened and it can be traced out farther. In contradistinction, the stripes at the side of the blood column are the visible vessel walls; these are not seen in essential hypertension unless there is also a vascular sclerosis, a scarring of the walls.

One may only hazard a guess as to the blood pressure reading by a glance at the fundus, because, in the first place, early cases of essential hypertension have no recognizable pathology unless one sees a spasm. In the second place, when organic changes have taken place in the vessel walls as a result of previously existing hypertension, the process is not reversible; but the vascular hypertension may subsequently become markedly reduced. Indeed, one of the characteristics of essential hypertension is the inconstancy of the blood pressure, it being at some times higher than at others. However, when one sees a spasm in a retinal arteriole, or when one sees the broadened reflex stripe, the comparatively narrow or irregular blood column of the arterioles, the lack of transparency of the vessel walls at the arterio-venous crossings, the banking of the veins, the compression of the veins, the moderate tortuosity of the finer arterioles either with or without small hemorrhages or exudates, one should be very suspicious of the blood pressure.

It is only by careful study of our cases that we can recognize the true state of the vessels. (I wonder how many ophthalmologists take the blood pressure and examine the urine of their patients. And I wonder how many internists look into the eye-grounds often enough to become familiar with their ophthalmoscopes. And how often do we consult with each other to check on ourselves to the betterment of our patients.)

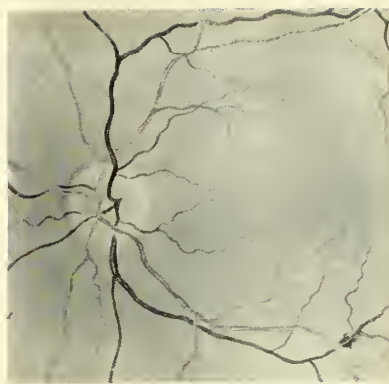
Two cases are illustrative of essential hypertension:

1. Mrs. L.R.C. (D-1647), age 52 years, first seen October



- (1) Loss of transparency of vein and artery
- (2) Banking
- (3) Compression (distal dilatation)
- (4) Wide central reflex stripe
- (5) Tortuosity

Fig. 2.



- (1) Loss of transparency
- (2) Banking
- (3) Compression
- (4) Peripheral dilatation and hemorrhage
- (5) Wide central stripe
- (6) Tortuosity
- (7) Irregularity of lumen
- (8) Narrowing of arteries
- (9) Accomp. stripes

Fig. 3.

25, 1938, complained of distress over the entire head, worse on use of the eyes, and occasionally associated with nausea and dizziness. Her general health had been good but she had occasionally had a slight rise in the blood pressure. She had been fitted with glasses two years before, and this had corrected a compound far-sighted astigmatism, and did need a slight alteration. She was a rather tense woman, emotional, unstable, the instability being of neural rather than endocrine type. Her blood pressure ranged from 150/75 to 190/100, the diastolic pressure being never over 100, and the blood pressure varying up and down whether on a rigid diet and bed rest or allowed considerable activity. There was a small amount of albumen and a few hyaline casts usually present in the urine, but no evidence of renal insufficiency; the blood chemistry was normal, the ability of the kidney to concentrate and to dilute the urine was normal, and there was scarcely any cardiac hypertrophy. This was verified by the reports of three excellent internists.

She was particularly interesting to me as an ophthalmologist for two reasons: first, she had a very early glaucoma of the non-congestive variety (verified by Dr. Frank Burch) and secondly, because of the fundus findings. On the first examination it had seemed to me that the vessels were quite normal. However, as I have been particularly interested in her from the standpoint of glaucoma, I have watched the optic nerve head and instead of seeing a glaucomatous cupping, I have seen the vessels develop the characteristic signs of essential hypertension, namely: slight irregularity of the lumen, slightly wider central reflex stripes, loss of transparency and banking of the veins.

2. My second case has been a patient for over 12 years. Mr. W.W.C., 45 years old in 1927, at his first visit, came simply to have his lenses changed. He was myopic, one eye slightly more so than the other. The notation made of the eye-grounds at that time was that they were quite normal, not even myopic changes being found. He was seen every few years till 1935, when in a regular physical examination Dr. Donald Abbott suggested that his eyes needed another check as he had found the blood pressure gradually rising (145/90) and marked nasal symptoms (subsequently found to be on an allergic basis) and he feared sinus disease with secondary involvement of the optic nerves.

Unfortunately, there is no notation of the condition of the eye-grounds at that time, although three years before, Dr. William Wilder (my predecessor) had noted "fundi normal." Two years ago he had felt that he was allergic to eggs and fats and had stopped smoking since which change in his routine he had felt better, but still had headache for which he often took as much as four phenacetin tablets per day. His physician, Dr. Frank R. Doll, had found his blood pressure increasing gradually.

In February, 1940, he went to the Mayo Clinic and Dr. Barker sent me the following report: There was moderate sclerosis of the peripheral arteries and a slight enlargement of the heart with an aortic systolic murmur. There were moderate

superficial varices of both legs. Special examination of the eyes showed high myopia, moderate narrowing and definite sclerosis of the retinal arteries with a large superficial hemorrhage and several areas of healed choroiditis nasal to the right disk. Special examination of the ears, nose and throat was essentially negative. The blood pressure varied between 200/120 and 206/140. Urinalysis showed albumin 2-plus on the basis of 4 but was otherwise negative. The specific gravity of the voided specimen was 1,029. Hemoglobin was 14 grams per cent; leukocytes numbered 8,600 and Kline test of the blood was negative. Roentgenologic examination of the chest and sinuses was negative except for a slightly thickened membrane in the left antrum. The blood urea was 38. The basal metabolic rate was plus-26.

We felt that the patient had an essential hypertension with moderate organic changes in his arteries. The cardiac and renal functions seemed to be fairly good. We did not feel that extensive sympathectomy was advisable in his case, but we recommended that he take a vacation and that he restrict his business activities without definitely giving up his business. We also suggested that when he returned home, he might consider a course of potassium sulphocyanate.

And on April 25, 1940: With regard to the question of hyperthyroidism, we felt that the elevated basal metabolic rate was due entirely to his hypertensive disease inasmuch as he had no definite symptoms suggestive of hyperthyroidism. It might be advisable for him to take some Lugol's solution, however, as this might possibly benefit the vascular lesions.

I saw him in April and found all arterioles smaller than normal, with rather broad central reflexes, and indenting practically every venule that they crossed. There were no hemorrhages or exudates, indicating that the large hemorrhage in the right fundus seen in Rochester had absorbed. However, the fields were interesting. The area of blindness above the right blind spot corresponded to a healed lesion of chorioretinitis at the disc edge. And the reduction in peripheral vision (concentric contraction) in both eyes corresponds to the lessening of the circulation in the peripheral retina, the result of reduction in the lumen of the arterioles.

NOTE: This patient died in December 1940 of a cerebral accident.

I have not taken up the very serious condition that results from essential hypertension, namely hypertensive vascular disease, not because it is not important, not because it is not interesting, but because the subject assigned was essential hypertension, and I desired to speak particularly about the early changes which we are all so apt to overlook, and to explain in the limited time at my disposal the whys and wherefores of those early changes.

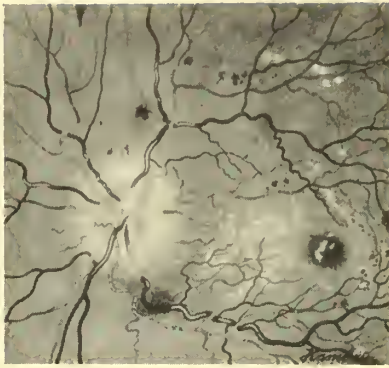


Fig. 4.

Severe
stage
hypertensive
vascular
disease



Fig. 5.

LATE STAGE

- (1) General
narrowing
of arteries
(2) Marked pallor
of disc

SUMMARY

1. In the early stages we can see no pathology unless we are fortunate enough to see a spasm of an arteriole. We must note just which branch is unusually contracted and search again. If at a subsequent time the same branch carries more blood than it did before, we can be sure it was in spasm and not organically changed.

2. During the spasm, the tissue supplied does not get its proper nourishment, and, therefore, cannot function properly. Temporary and fleeting blind spots in the corresponding fields result. After the spasm is over, edema develops; this also causes temporary scotomata.

3. As a result of the repeated spasm, the arteriolar musculature becomes hypertrophied and the central reflex stripe is broadened.

4. As a result of the vascular hypertension the perivascularis is hypertrophied rendering it less transparent, and where it crosses or accompanies a venule, there is usually some change in the perivascularis of that venule.

5. The repeated pulse beats are repeated injuries—minor to be sure—that cause a defense reaction in the vessels. Where an arteriole crosses a venule, if the insults have lasted for some time the common perivascularis will have thickened and contracted to some extent; the venule will be pulled out of its former course (banked) and the blood stream will be interfered with (compression) causing a passive hyperemia (distal dilatation) and occasionally a thrombosis and hemorrhage.

6. If the blood pressure suddenly rises from a former level, hemorrhages may result. If these are from the main arterioles, the extravasation will be in the anterior layers (flame shaped if small vessels break, larger "pre-retinal" if larger vessels break); if the small branches that penetrate the retinal layers break, the extravasations will be small and usually round.

7. As the muscularis and perivascularis hypertrophy and crowd on the lumen less blood can be carried and the tissues supplied by the most peripheral branches suffer. This causes gradual shrinkage of the fields.

MINNESOTA RUNNER-UP IN INFANT MORTALITY RECORD

Deaths of infants under one year of age, exclusive of stillbirths, totaled 108,846, according to a final census report released recently, which covers 1939.

This was in comparison with 116,702 similar deaths the year previous and represented a reduction in the ratio per 1,000 live births of from 51 to 48.

That the present death total for infants—equal to the total population of cities like Canton, Ohio, and Tampa, Florida—is susceptible to further drastic decreases is indicated by the achievements of certain states. If, for instance, the entire United States achieved the same low infant death rate that Oregon has achieved, there would have been approximately 28,000 fewer infant deaths in 1939. If, on the other hand, the high rate of New Mexico had prevailed nationally, it would have meant an increase of more than 138,000 infant deaths.

The fourteen states which achieved an infant death rate of less than 40 per 1,000 live births were, in order, Oregon, 35.5; Minnesota, 35.8; Connecticut, 35.9; Nebraska, 36.5; Washington, 36.8; Massachusetts, 37.0; Illinois, 38.0; New Jersey, 38.7; Iowa, 38.8; New York, 39.3; Rhode Island, 39.4; Kansas, 39.4; Indiana, 39.5; Utah, 39.5.

The Rôle of the General Practitioner in Detecting Tuberculosis*

Cedric Northrop, M.D.

San Haven, North Dakota

SINCE that day in March, 58 years ago, when the German country doctor, Robert Koch, announced the discovery of the tubercle bacillus, definite progress has been made in the control of tuberculosis. Whereas it ranked as Captain of the Men of Death, at the turn of the century, with an annual mortality rate of 200 per 100,000, it has now dropped to seventh place with a rate in the United States of 43. The factors that have brought about this change are numerous, among which are: a definite biologic change in the disease itself—its advances had first begun slightly to lose some of their severity beginning back shortly after the Civil War. Tuberculosis flourishes best under poor environmental conditions such as overcrowding, poverty, ignorance and poor hygiene. With the general elevation of the standards of living, of better housing and with the populace learning a little about public health measures, there has developed collectively a less favorable human culture medium upon which the bacillus can grow. The modern tuberculosis control program is a very important factor in lessening the incidence of the disease.

However, our battle is far from won—in fact it has only well started. Tuberculosis is still first as the cause of death in the age-group of 15 to 45. Taking into consideration all strata of society, these three decades represent the most useful period of a man's or woman's life. From the social and economic standpoints, tuberculosis ranks jointly with schizophrenia as the most important disease with which we are confronted today. If the trends established by the past 40 years were to be continued for the next 60 years, it would be possible to close many American tuberculosis sanatoria or else convert them into mental institutions. Even today the Federal Government is recommending that any new tuberculosis sanatoria being built should be designed so that they may eventually be converted into mental institutions with a minimum of financial loss.

The first step in any control program is the provision of adequate hospital beds for the isolation of all positive sputum cases and the treatment of all patients with demonstrable activity. For many years the tuberculosis program in North Dakota was handicapped by lack of hospital facilities. A long waiting list was an important stumbling block to be removed. In 1935 funds were provided for the new infirmary unit at the sanatorium, work was begun in 1936, and it was completed in 1937. Upon its completion the bed capacity of the sanatorium increased to 368 and the waiting list was abolished. There have been beds continuously available on short notice ever since that time. Not infrequently, I receive

communications in which some physician reports he has diagnosed a case of tuberculosis and wonders how long the patient will have to wait before he can secure admission to the sanatorium. The answer is that the patient can come immediately upon receipt of the two simple admission forms. In 1939, the figures released by the National Tuberculosis Association on hospital beds available for the previous year in the United States revealed that in the state of North Dakota there were almost exactly three beds available for tuberculous patients for every death occurring from the disease during that year. This was the second best ratio of any state in the Union, being slightly exceeded only by Colorado which has several sanatoria for non-residents. So hospitalization is adequately provided for, and with the slow decline of the disease as shown by present trends, no additions probably ever need be contemplated.

The second step in any control program is the examination of all contacts. Every case of tuberculosis comes from another case and the effort expended in checking up on the relatives and members of the same household is effort well spent. At the sanatorium at the present time there are ten pairs of patients who are siblings. There are 17 patients more, now in residence, who have had a brother or a sister who was a former patient. The seeding down of great numbers of tubercle bacilli into the lungs of children by tuberculous parents is a very fruitful source of subsequent adult type of disease. The longer the exposure and the more massive the dosage the greater the possibility of subsequent development of clinical disease. From one family in an adjoining county there have been admitted to the sanatorium seven patients with the adult type of disease within the past four years; five are now in residence.

To check up on contacts, one should do tuberculin tests and X-ray all the positive reactors. The most accurate mode of determining tuberculin sensitivity is by the intracutaneous or Mantoux test using P.P.D. (purified protein derivative). The solution must be freshly made up and used within a few hours. Old solutions are inactive and account for many of the failures reported. Other failures are due to the erroneous injections subcutaneously. If a nurse is entrusted with the responsibility of giving the test, it is imperative to check her technic occasionally in this connection. Employment of the usual recommended dose of .00002 milligrams as a first test dose and if it be negative, use .005 milligrams for the second dose is the safest procedure. This is preferable to the utilization of the 1/10 cc. of 1:1000 old tuberculin so commonly employed formerly, as one occasionally encounters some severe reactions in individuals with marked allergy; necrosis and ulceration result which are quite embarrassing.

*Read before the North Dakota State Medical Association annual meeting, Minot, May 7, 1940.

In large-scale case-finding surveys, the two test dose adds considerable to the expense, but when checking up on individual contacts it is distinctly better. In reading the test in 48 hours, one looks especially for edema of the skin; to detect its presence one passes his finger repeatedly over the site of injection and the presence of a button-like area of induration is the significant factor in interpretation. Recent articles have appeared recommending the use of various patch tests, but as yet this technic has not received the approval of public health authorities. Perhaps it will be better standardized and will be given this approval somewhat later. The tuberculin test is a screen to sift out and eliminate the non-allergic. Following this, to secure a good X-ray film of the chest of the positive reactor and having it read by someone familiar with interpretation, completes the job unless follow-ups be indicated thereafter.

While on the subject, I am going to digress a moment and reply to a question given me recently. Does a person who was once positive to the tuberculin test remain so the remainder of his life? The answer is: not necessarily. If he has had a large number of bacteria, or if there are subsequent exogenous re-infections, he will probably remain positive always. However, if the initial dose were not large, and there are no subsequent exogenous re-infections, it is possible for those bacilli to die out and to become encapsulated so that no longer is there any tuberculo-protein fed into the bloodstream and no longer are antibodies produced. As a part of the body metabolism the antibodies are eliminated over the years and the patient becomes negative. Recent reported surveys on school children would indicate that in those who have previously had positive tuberculin reactions, approximately five per cent will become negative per year thereafter when subsequent surveys are made. This takes place particularly in individuals living in communities where the general level of tuberculinization is low and they are not constantly exposed to exogenous re-infections.

The real key to success in the present program for tuberculosis control in North Dakota depends upon the general practitioner. Because of the rural nature of the state, it is doubtful if widespread case-finding surveys on school children with tuberculin testing and group X-raying would produce results commensurate with the expense for a state that is poor. A survey of adults and of college students is always worth-while, however. In the cities there is tending to be a shift from the tuberculin testing of school children to testing of adults, for example, all the employees of a business or an industry such as the telephone company, or all the employees of the city light works, or all the employees of the street car company and so forth, would be examined and X-rays of all positive reactors made. Certain life insurance companies have had group surveys of all their employees and the number of cases of active tuberculosis picked up, and the number of suspects that have been tabulated for subsequent observation have been entirely commensurate with the expense involved.

Tuberculosis is classified as minimal, moderately advanced, and far advanced, depending upon the volume of pulmonary tissue involved. Now then, of the patients with tuberculosis admitted to the sanatorium during the previous biennium in round numbers, 20 per cent were minimal, 40 per cent moderately advanced, and 40 per cent were far advanced; altogether 80 per cent are in the advanced group. These ratios are almost exactly the same as the neighboring Canadian province of Manitoba.

There are several reasons for this state of affairs. In the first place, there are many instances in which a moderate amount of tuberculosis is compatible with a fair degree of general health. The process has to assume major proportions before a person becomes aware that anything is wrong. Studies have been made proving that the far most common complaint generally that patients have when they consult a physician is pain. Mother Nature made a great error when she constructed the lung, in that the only nerve ends for pain are located in the parietal pleura and in the larger bronchi and blood vessels. This explains the frequent occurrence of an extensive, painless tuberculous lesion. A previous pleural symphysis usually eliminates the pleural surface as a source of pain. As we see him at the sanatorium the average citizen in North Dakota is a farmer. He works hard; the struggle for existence is not easy, so that his life is an arduous one. He does not go to a physician with every little ailment. He is inclined to put up with his tonsillitis, sinuses, refractive errors, dental caries and hemorrhoids as a cross that he has to bear. To have these conditions remedied often represents a luxury he can ill afford. Likewise if he has pulmonary disease, he is prone to let his cough go until weakness, dyspnea or hemorrhage force him to seek medical advice. Such is the genesis of many a far advanced case which enters the sanatorium with a prognosis that is either hopeless or at best questionable. The mortality rate for far advanced lesions is approximately 30 per cent on first admission alone.

The opposite side of the picture is the minimal case. I can count on the fingers of my two hands all the cases of minimal tuberculosis that I have seen that could not be rehabilitated with reasonable sanatorium care and cooperation on the patient's part. These were all 'teen age youngsters or else had a complicating tuberculous tracheo-bronchitis. The above mentioned causes serve to explain the origin of somewhat over half of our far advanced cases. About one-fourth are due either to ignorance, fear or obtuseness on the patient's part—which is difficult to correct. They would not recognize facts and face the situation until it had become very serious or else irremediable. Then we come to the tragic fifth or sixth of the far advanced cases who have sought medical aid at an earlier date but had not been rewarded with an early diagnosis. The history had been taken and physical examination of the chest performed, and the patient told he had bronchitis, given an expectorant cough mixture containing codeine and dismissed. That is indeed sad, and it is still happening today. Remember

the old aphorism: "Any cold that lasts six weeks is probably tuberculosis"?

To diagnose tuberculosis early, it is necessary to keep the disease in mind, to seek it out before it has reached the stage of phthisis, of cachexia, of consumption. As a sporting proposition, I have usually listened to the chests of new patients as they come into the sanatorium before looking at their X-rays, record the findings in the chart and then examine the films. The astounding paucity of physical findings in many advanced cases teaches one a healthy distrust of placing any considerable reliance in one's percussion or stethoscope. The one finding which is least apt to be undependable is the presence of moderately coarse, moist rales that persist on expiratory cough over the area of tuberculous involvement. Roughly, 15 per cent of cases presenting cavitation on X-ray cannot be detected as tuberculosis on physical examination of the chest.

There are certain groups of patients in which tuberculosis is more common and should, therefore, be suspected oftener, and these should be more closely scrutinized. The diabetic is one. Various series of case reports indicate that the frequency of tuberculosis among the diabetic is four to six times as great as among the non-diabetic population. This fact is not widely known. Any patient with diabetes mellitus irrespective of his age, should have a tuberculin test, and if positive, an X-ray. If the film is negative for clinical disease, he should have repeat films at least annually thereafter. If at any time he has any considerable episode when his carbohydrate tolerance was lowered, or during an intercurrent infection his diabetes uncontrolled, he should have a chest film.

Another group is the 'teen age youth. When stricken by tuberculosis they are prone to have more widespread exudative lesions and to run a more fulminating course than the same involvement would produce ten or twenty years later. A more aggressive policy of therapy is required, and, even so, the results are somewhat less productive of accomplishment.

Certain racial groups are notorious for their tuberculinization. The Negro is one. In North Dakota there are few, there is none now at the sanatorium. But the Indian is our racial problem. So let us consider this subject for a moment. Last year there were 138 deaths from tuberculosis in this state. This represents a rate of about 21½ per 100,000 for all the population. Of these 138 deaths, 37 were among the Indians. The Indian population being 10,000, this gives us a death rate of 370 per 100,000—a frightful figure and about equal to, or slightly exceeding, the rate among Negroes in the metropolitan centers and in the deep South. The remaining 101 deaths give a rate of between 15 and 16 for the white population of the state. If there were no Indian deaths, the state of North Dakota could boast the possession of the lowest death rate of any state in the Union. It is sincerely to be hoped that the Federal Government will finally awaken to the necessity of doing something about this deplorable situation among its wards. This nucleus of uncontrolled tuberculosis repre-

sents a hazard to the remainder of the state as the Indians do not stay strictly on their reservation. The men leave the reservation seeking work and travel all over. It is high time that Uncle Sam arouses from his lethargy on this point. In the meantime the physicians who practice in communities adjacent to the Indian reservations must remember the high degree of tuberculinization in these areas, both in the Indian and in the individual of mixed blood.

It has already been pointed out that tuberculosis is the commonest cause of death in the age-group of 15 to 45. It is true that these are the years of most frequent involvement, but the aged are not spared. It is now beginning to be appreciated that the disease is seen much more commonly after 50 than was ever previously suspected. Of the 315 patients now in residence at San Haven there are 23 who are 50 years of age or over; 14 who are 60 years of age or over; 4 who are 70 years or over, and one is 80 years old. The problem of therapy is difficult in this older age group but from the public health aspect they are exceedingly important because many of them stay at home and because very large amount of cough disseminates bacteria about the household in myriads, and in so doing infects others heavily.

Supposing that you have picked up a case of active pulmonary tuberculosis in a parent, and in applying Mantoux tests and taking X-rays on the offspring you find all of the children positive reactors and two or three with definite evidence of parenchymal or glandular involvement by a primary lesion. Should they be sent to the sanatorium? It was formerly believed all over the country that the hospitalization of patients with childhood type of tuberculosis was a worth-while procedure. There has been considerable data accumulating to prove that it is money not well spent to hospitalize first infection tuberculosis. When there were inadequate beds for the active adult cases it was perhaps feasible to hospitalize a limited number of children in order to protect those children from a positive sputum in the household. Myers at Lymanhurst Center in Minneapolis has collected evidence to prove that primary tuberculosis is for the most part a self limited disease. It merely requires good hygiene, adequate diet, an amount of rest proportional to the severity of the involvement and most important of all, that the contact from whence the youngster received his infection be broken. Following out this thought there has been a closing of preventoria all over the country. The one at the sanatorium was closed in 1937. There are other things to which money can be applied in tuberculosis work to better advantage than hospitalizing primary tuberculosis. Break the contact, give the youngster good hygiene and care at home and he will do as well there as in a preventorium. Periodic X-rays are indicated until the process has become stable for a year at least.

My special message to general practitioners is, that you make every effort to locate and examine the contacts of diagnosed cases of pulmonary tuberculosis in your community. I have been authorized by Miss Helen Katen, executive secretary of the State Anti-Tuberculosis Asso-

ciation, to inform you that there are funds available for the examination and X-raying of all contacts of diagnosed cases who cannot afford the cost of such an examination. It is merely necessary to communicate with the local or county chairman to that effect and funds will be provided to defray the cost of the examination. These funds are secured from Christmas Seal sales. We want every contact examined and the necessary follow-ups carried out if they be indicated. This is your duty and as outlined just a moment ago, it need not be a thankless task.

In past years the reporting of cases of tuberculosis to the State Health Department has been most erratic and spasmodic. The basis of a successful campaign against any disease is to know how much of it there is. I am voicing the sentiment of the health department when I earnestly request that you be faithful in reporting your cases to them.

When patients are discharged from the sanatorium it is our wish that each and everyone should return to the physician who referred him to the sanatorium. Those patients who need pneumothorax refills should be taken care of by the family physician if he is familiar with this type of work and has the necessary equipment, namely a pneumothorax machine and a fluoroscope or X-ray machine, preferably all three. It is the legal responsibility of the county from whence the patient came to take care of the expense of these refills for those who

are unable to pay. It has been recommended that a maximum charge of \$5.00 be made (this including fluoroscopy) with a maximum of two charges per month, by which I mean, in the occasional, infrequent individual who will need three or even four refills per month, that a maximum monthly allowance of \$10.00 be set. Some such a system is used a great deal in the cities. Now then, in those indigent individuals who need refills and the counties refuse to authorize them, the State Anti-Tuberculosis Association has a limited amount of funds that may be expended for that purpose. It is to be remembered that essentially tuberculosis is a long-drawn-out chronic disease with an inherent propensity to undergo relapses at a later date. When a patient is discharged from the sanatorium it will be appreciated if you will keep an eye on that individual, to ascertain if he is remembering what he learned while at the sanatorium about careful living, and respect for others concerning infectivity.

Although there has been much improvement in the tuberculosis situation, much is yet to be accomplished to give North Dakota the undisputed most favorable rating in tuberculosis morbidity and mortality. As the tuberculosis control program is now constituted, the general practitioner is the most important link in determining its success. It all hinges on you. The most pressing necessity now is that cases be diagnosed earlier, and the contacts be faithfully checked.

X-Ray Therapy in Infections and Tumors*

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THE use of the X-ray, in the treatment of both acute and chronic infections, has increased tremendously in the past few years. This increase has been largely due to a standardization of the basic dosages. The basic dosage of radiation can now be as accurately determined as the proper dose of a drug, providing one has his machine accurately calibrated and frequently checked. This basic dosage in most infections is usually small. The usual dosage at 100 K.V. is from 75 to 100 R. measured in air. Erysipelas is the one exception to this rule and here the dosage increases to 300 R. Needless to say this dosage must not be exceeded, nor must it be repeated on the same area. Where 140 to 200 K.V. radiation is employed, the average dose for treatment is from 100 to 250 R. Small doses are the rule in the acute infections. Chronic infections, such as calcified bursitis, require larger doses.

The interval between treatments is usually five to seven days. The more acute the infection, the shorter

the interval between treatments. Acute parotiditis may require a second dosage in from 24 to 48 hours. The usual acute case requires generally only one treatment. The average chronic case requires one to five treatments, three being the average. If there is no response after three treatments, further treatment is useless. However, if there is noticeable improvement after the second or third treatment, treatments can be continued judiciously until five or six have been given. In all cases the dosage must be kept sub-erythematous. An accurate prognostic index is the response to the first treatment. If we obtain either a marked improvement or a definite exacerbation within twenty-four hours, a definite cure can be anticipated.

The use of ultra-violet radiation in the treatment of erysipelas is definitely dangerous where sulfanilamide has been given. X-ray treatment, if employed in such a case, should be used cautiously as severe local and systemic reactions have been reported.

We at present are employing X-ray in the treatment of the following:

*Read before the South Dakota State Medical Association annual meeting, Watertown, South Dakota, May 21, 1940.

A. Acute Infections:

1. Erysipelas. This disease responds to ultra-violet radiation, sulfanilamide and X-ray. We employ X-ray in adults and ultra-violet in children. The dosage of X-ray in adult erysipelas is 250 R. at 100 K.V. with or without 1 mm. of aluminum. The advantage of X-ray treatment in adult patients is that in the rare case where we do not get an immediate cure, ultra-violet can be given at once over the same area. A further reason is that the reaction following ultra-violet is painful. The reason we use ultra-violet radiation in children is that the child is often difficult to control and over dosage with X-ray might occur. Over dosage with ultra-violet fortunately has no late or lasting bad effects.

2. Boils. These should be treated at 100 K.V. with or without 1 mm. of aluminum; the dosage is 150 to 250 R. A second smaller dose may be given in forty-eight hours if necessary.

3. Carbuncles. These should be treated at 140 to 200 K.V. with $\frac{1}{4}$ to $\frac{1}{2}$ mm. of copper; the dosage is 150 to 250 R.

4. Cellulitis and lymphangitis. These should be given the same dose as carbuncles. If there is not a sharp drop in the patient's temperature within the first twenty-four hours the dose should be repeated.

5. Parotiditis. The dosage is 150 R. Repeat in twenty-four hours if no temperature drop. Both sides should be treated even if only one is affected. Treat early in course of disease. Swelling will persist for some days but a drop in temperature indicates that the infection has responded. Good results in this disease are in direct proportion as to how early treatment is instituted after symptoms begin.

6. Gas Gangrene. X-ray treatment is continuously being reported of great value. Personally I have treated only one case. This case was advanced, apparently hopeless, but responded to treatment within twelve hours. The dosage is small; 75 to 100 R. are given daily.

B. Sub-acute Diseases:

1. Bursitis. X-ray treatment offers a greater hope of cure in sub-acromial, sub-deltoid, and para-shoulder inflammations than any other treatment. One to six treatments are given at five to seven day intervals, dose 150 R. at 140 to 200 K.V. The areas treated should be rotated in consecutive treatments; front to back, back to front, and laterally. Calcium deposits can be absorbed by this method of treatment. Where the shoulder is "frozen" by fibrous adhesions of over six months duration they do not respond and are best treated by manipulation under anesthesia. The earlier the disease is seen, the more favorable the result. A cure can be expected in from 75 to 80 per cent of all cases.

2. Myositis and fibrositis. Especially in the lumbosacral region, these respond as favorably as bursitis. If a favorable result does not ensue, the case should be reconsidered from a diagnostic standpoint. The total dosage should not exceed 500 R. in doses of 150 to 200 R. at 140 to 200 K.V.

3. Sciatica and other forms of neuritis. These frequently respond to X-ray treatment. Where there is a definite nerve distribution, treatment should cover part of the peripheral area as well as the nerve root.

4. Paranasal sinusitis. Carefully selected cases frequently receive great benefit from X-ray treatment.

5. Swollen lymphoid deposits. Tonsils and adenoids, when for some reason operation is contra-indicated, can be reduced in size and partially cleared of infection by X-ray treatment. The same treatment applies to the lymphadenopathy frequently seen in children.

6. Tuberculous glands. X-ray therapy is, of course, the accepted treatment of this condition. The response is usually slow. Dosage is 150 R. at 140 K.V. repeated at four week intervals, copper filtration. Usually six months elapse before regression of glands. Do not over-treat as late telangiectasis may occur.

C. Chronic Inflammatory Diseases:

1. Arthritis. There are many patients with chronic arthritis who will have a certain amount of relief from pain with X-ray therapy. Results are, however, inconsistent and the patient must be instructed not to expect too much and except for the relief of pain the course of the disease will not be affected.

2. Senile osteoporosis with pain. Approximately 40 to 50 per cent of these patients will receive some relief from pain with small X-ray treatments applied at intervals.

3. Asthma. Selected cases of asthma can be carried through severe attacks with moderate dosages of X-ray. Its main value is palliative for the immediate time and subsequent bouts will follow unless desensitization or change of climate can be affected.

D. Radiation Therapy in Tumors:

Since the upheaval of all X-ray therapy a few years ago by the development of higher and supervoltage X-ray machines, a gradual stabilization of methods and technics has evolved. The larger machines have found their place and their real value has been determined. Their higher voltages have enabled the roentgenologist to secure better depth dosages in large patients. However, any specificity of this type of radiation for tumor tissue has been largely disproven.

The two greatest factors in the improved results we have obtained in the past few years have been, (1) the greater tube skin distance with a resultant increase in the depth dose and (2) the general adoption of the prolonged fractional method of treatment devised by Coutard.

Coutard, of the Curie Institute of Paris, has for many years been working with 200 K.V. He has increased the filtration and increased the tube skin distance far above those used by other workers. His system relies on the daily administration of doses of 150 to 300 R. and is carried on over a period of from three to six weeks, depending upon the size of the dose the patient can tolerate and the number of fields treated. By this method, doses of 2,000 to 5,000 R., or from three to six erythemas, can be given to each field. The reaction

in the skin and surrounding structures, while marked, still permits their return to normal.

Coutard is now working with 400 K.V. and employing the same technic. He feels that in the tumors which are sensitive to radiation at 200 K.V. he has obtained better results at 400 K.V. This method of treatment was first used by Coutard in the treatment of malignant tumors of the tonsil, larynx, and buccal cavity. This same type of method of treatment is now employed in all deep-seated malignancies as well. Regardless of the voltage used, this method is now generally employed in the treatment of all malignant growths, occurring anywhere other than on the surface of the body.

The last few years have taught us, that the limitation of the dose to a given lesion is not the mechanically measured dose, but the capacity of the normal surrounding tissues to recover from the dosage. This factor determines the absolute end point to which any X-ray dose can be carried.

An interesting development that has found considerable favor in Europe is the so-called method of Chaoul, in which a small self-contained generator and X-ray tube are placed in contact with the lesion itself, either directly as in the case of accessible malignancies such as the cervix or skin, or through a surgical approach to the growth. This has been applied especially to lesions of the bowel and kidney after exposure. Such an apparatus is necessarily limited to lower voltages, the highest about 90 K.V. With the low filtration and short distances a very rapid delivery of radiation can be effected. The effect is, of course, local and cauterizing, and somewhat comparable to contact application of radium except that the time of delivery of an effective dose becomes possible in a few minutes.

In the selection of patients and lesions for treatment there have been few radical changes, but there have been modifications in technic and some crystallization of ideas as to proper treatment.

In the female where carcinoma of the breast, uterus and ovaries accounts for the largest portion of malignancy, ideas of technic have become more uniform. Carcinoma of the breast remains primarily a surgical disease with practically all workers agreeing on operation with postoperative radiation. Pfahler and Vastine of Philadelphia, in a large series of cases showing five-year statistics, advise more preoperative radiation and their figures show definite improvement in five-year cures, where preoperative radiation and postoperative radiation have been used. They recommend preoperative radiation especially in cases of group II where axillary glands are palpable and follow a dosage of 900 R. per field to each of three or four fields in two weeks by radical surgery. As soon as primary union is effected (usually in 7 to 14 days), the postoperative series is begun and a similar or larger dose is added as the patient's tolerance permits. In group III cases they recommend a heavier pre-

operative series followed by a six-weeks' wait before operation. They quote figures from the literature of 28 per cent five-year survivals by operation alone in group II cases which is increased to 40 per cent by postoperative radiation. In their own series of 400 cases they claim 52 per cent survivals with postoperative radiation and when preoperative is added, 57 per cent.

A well-advised adjunct to the treatment of carcinoma of the breast in menstruating women is the production of an artificial menopause. Experimental work in cancer strains of mice has shown a definite decrease in incidence of mammary cancer in castrated females. It seems reasonable to believe that an artificial menopause is of value and the clinical results to date have borne this out.

In the treatment of recurrence and metastases there has been little or no important progress. It is still apparent, though, from the frequent improvement and palliative response, that these patients are entitled to the benefit of a heavy course of radiation to the affected areas.

In the treatment of carcinoma of the cervix, the method advocated by Healy of Memorial Hospital in 1933 has become the predominating one. Here again the fractional method, carried out over a period of approximately four weeks using multiple ports and the intensive dosage possible by such technic, has given improved results. The dosage per field has been carried to from 1,800 to 3,000 R, depending somewhat upon the field choice. The indications in the different groups remains more or less the same. In the few patients found in group I with the disease definitely limited to the cervix, radium is the major factor in the treatment with X-ray added to build up the radiation dosage in the adnexa. Groups II and III are by choice first given an intensive dose of X-ray followed immediately by the use of radium. Group IV is treated largely palliatively and for this the high voltage X-ray offers the best medium of attack. With the use of heavier doses some complications such as proctitis with late stricture are more commonly seen, as well as an atrophic type of vaginitis. With this type of treatment the attempt is made to rely on one series of combined radiation from X-ray and radium, as subsequent series do not have as salubrious a result and are subject to a higher incidence of complications.

In the gastro-intestinal tract X-ray therapy, except in some few instances, does not have much to offer. Attention should again be called to the fact that some carcinomas of the cardiac portion of the stomach are sensitive and do respond to treatment. The treatment of carcinoma of the large bowel is, on the whole, rather disappointing but occasional cases show definite benefit. The factor of unusual response is well demonstrated by two cases of pseudomyxomatosis peritonei treated by us, in which both patients have been free from symptoms for over three years.



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THE PEDIATRIC NUMBER

In accordance with a custom that has been observed for several years, the JOURNAL-LANCET again commemorates Child Health Day by devoting the May number to pediatrics. It is a privilege to participate in activities designed to promote the health of children.

This number of the JOURNAL-LANCET presents discussions relative to child psychiatry, the care of premature infants, the administration of fluids to infants and children, the diagnosis and treatment of erythroblastosis fetalis, the solution of orthodontic problems, the repair of congenital diaphragmatic hernia, the treatment of hemangiomas, the nutritional states, the use of beta lactose as a prelacteal feeding, the treatment of epilepsy and the methods by which the monotony of periods of convalescence may be eased.

Perhaps the problems that arise in the period of con-

valescence deserve special attention. Idle confinement to bed during the time the transition from illness to health is taking place is irksome to children. Relief from this situation can be obtained, however, by the judicious application of a planned program which stimulates the child's interest in scrap books, bead work, card darning, soap carving, puzzles, drawing, reading, radio programs, aeroplane construction, and many other entertaining projects. When these diversions are incorporated in the daily routine care, an escape from much of the monotony of the period of convalescence has been supplied. By utilizing the suggestions offered by Dr. Clarke in his treatise on "Easing Convalescence" the child's emotional needs are not neglected, and the patient derives benefits from the practice of the art, as well as of the science, of medicine.

C. A. S.

TUBERCULOSIS AMONG CHILDREN

The number of children infected with tubercle bacilli has been greatly reduced in many parts of this country. Stewart found the infection attack rate to be only about 1 per cent per year. Slater reported less than 10 per cent of grade school children in his district infected, and in one county he and Vadheim found that only 5.2 per cent of school children, including those in high school, were infected.

That the number of infected children can be definitely decreased has been demonstrated by Jordan. Tuberculin testing of school children in a given area about ten years ago revealed that 14.1 per cent were infected. Recently, among children of the same area only 6.75 per cent reacted. This reduced incidence followed the institution of a well organized program to control tuberculosis. In communities where 1 per cent or less of the population becomes infected with tubercle bacilli annually, it is obvious that the first infection occurs more frequently among adults than among children. Whenever the infection occurs it is met by the effective defense mechanism of the human body. The reaction on the part of the tissues is nonspecific. However, after the tissues become sensitized to tubercle protein bacilli which are transplanted from the original lesions or those which may be introduced from exogenous sources cause a specific reaction on the part of the tissues. This is when trouble may begin with reference to the development of clinical tuberculosis.

As long as endogenous or exogenous reinfection does not occur, tuberculosis is an extremely benign disease. Therefore, lesions resulting from the primary infection do not require treatment. Since this fact has been recognized there has been a widespread movement to close preventoria and similar institutions formerly designed to treat children with only the first infection type of tuberculosis. One of the most recent institutions to be closed is the Blue Mound Preventorium in Wisconsin. This institution was established in 1906 when the Milwaukee *Sentinel* conducted a campaign to raise funds for it. In 1907 this paper announced the purchase of an eleven-acre farm for \$8,000.00. In 1911 the financing

of this institution was turned over to the city of Milwaukee and in 1921 to the county which was eligible to receive state aid. Since that time it has been operated as a preventorium in conjunction with the Muidale Sanatorium. By closing the Blue Mound Preventorium, the county sanatorium staff may be expanded and clinics established in districts where the disease is most prevalent. Thus, adults with contagious disease will be discovered, isolated and treated so that a better environment for all children may be created.

The initiation of the movement to discontinue institutional treatment of children with only the first infection type of tuberculosis as well as its successful operation has been due in no small part to the splendid researches and the fine contributions of Dr. C. A. Stewart, who has edited this special issue of the JOURNAL-LANCET.

J. A. M.

ASSOCIATION MEETING

This is the convention season. The South Dakota State Medical Association meets at the Widman Hotel in Mitchell May 18, 19, and 20; the South Dakota Academy of Ophthalmology and Otolaryngology meets at the same place May 19th. The North Dakota State Medical Association meets in the High School Auditorium at Grand Forks May 19, 20, 21. The Minnesota State Medical Association meets in St. Paul May 26, 27, and 28.

These all precede the 92nd session of the American Medical Association at Cleveland, June 2-6 this year. The Montana State Medical Association has chosen June 23, 24, 25 as the date for its annual meeting to be held in Great Falls with headquarters at the Rainbow Hotel.

Never in the history of organized medicine has it been more important than now for members to attend and take part in the discussions at these meetings. In a representative form of government it is not only a privilege but a duty to attend. We learn a lot from others and often contribute a bit ourselves, but above all we keep informed of progress and trend of the times.

A. E. H.

Book Reviews

Healthful Living, by HAROLD S. DIEHL, Dean of Medical Sciences, University of Minnesota. New revised edition, 500 pages. New York: Whittlesey House: 1941. \$2.75.

Dr. DIEHL's training in public health, student health and medical school administration eminently fit him for this exposition on proper modes of living. He writes for any intelligent layman to read but there is no hint of "writing down" to the general public. Debunking popular misconceptions of the

panacean value of vitamins, sunlight and exercise, DIEHL states:

"The time may come when we shall have rest clubs as well as athletic clubs . . . We are still too much inclined to boast of the small amount of rest on which we can get along . . . To entice the average American to rest in the daytime one must camouflage the rest with mysterious measures such as light treatment, massage or sun bathing."

He writes authoritatively on communicable disease. The volume can be read with profit by all practicing physicians as a model of public dissemination of medical knowledge. Many of the statistical charts are of great reference value, especially the beautifully illustrated mortality and morbidity statistics. Dr. DIEHL has made liberal and effective use of recently developed chart technics. Though not written for physicians, this book is recommended for the office library.

Man's Greatest Victory Over Tuberculosis, by J. ARTHUR MYERS, Ph.D., M.D., F.A.C.P., Professor of Medicine, Preventive Medicine and Public Health, University of Minnesota; 419 pages with 31 illustrations; Springfield, Illinois: Charles C. Thomas: 1940.

Discussing as it does the history of tuberculosis and other diseases of animals, their economic and medical relationship to man, and the virtual eradication of bovine tuberculosis, this book contains a wealth of factual information on which is based the thesis that the same methods used by the veterinarians should be employed by physicians to eradicate human tuberculosis.

After describing the birth and growth of veterinary medicine, the history of present-day knowledge of tuberculosis is pleasantly told. These two developments merge in the inception of the anti-tuberculosis campaigns involving cattle. All of the methods of stamping out tuberculosis in European and other countries is described. Then the measures, instituted in the United States in 1917, which have reduced tuberculosis incidence from 50 per cent in some localities to less than one-half of one per cent in all but two of the 3,071 counties of this country, are credited to the astuteness of the veterinarians.

In all foreign as well as in the American campaigns, tuberculin testing has been the sheet anchor of the veterinary. Diagnosis of bovine tuberculosis is dependent entirely upon a positive tuberculin reaction. Such a reaction is sufficient proof of infectiousness to other cattle that every cow showing a positive tuberculin reaction is slaughtered. Strict adherence to these tenets has practically eradicated bovine tuberculosis in the United States.

From a delineation of these events, the author aptly points out that the minutiae and technical details, such as are now obscuring the panorama of the conquest of human tuberculosis, did not divert or obstruct the fight of the veterinarians against bovine tuberculosis. Throughout the volume is the unvoiced plea that physicians grant humans the same privileges which have rid cattle of the plague of tuberculosis.

This book pays high tribute to veterinary medicine. Written as it is by one of the most erudite of present-day anti-tuberculosis physicians, it is a storehouse of information of value to anyone interested in tuberculosis. It is a reference which should be in the library of every tuberculosis or chest specialist, sanatorium physician, internist, public health worker, and even every general practitioner.

Rheumatic Fever, by MAY G. WILSON, M.D., New York Hospital and Dep't. of Pediatrics, Cornell University Medical College; 600 pages; New York: Commonwealth Fund Division of Publications. Price \$4.50.

Rheumatic Fever by MAY WILSON is the most scholarly and comprehensive volume on this subject that has come to the attention of this reviewer. It represents 20 years of earnest study and research of the etiology, epidemiology, manifestations, diagnosis and treatment of childhood rheumatism. The book is divided into five parts.

Part I deals with the epidemiology and etiology of the disease. Such phases of rheumatism as the heredity, the bacteriology and the immunology are dealt with in the greatest detail.

Part II discusses the clinical and pathological aspects. Here the reader will be brought up to date with full information concerning endocarditis, both chronic vascular and subacute bacterial.

Part III is an elaborate description of the course of rheumatic fever in the first three decades of life. This is based upon meticulous case histories and their graphic presentation in 647 individual patients.

Part IV thoroughly considers the criteria of differential diagnosis. Such special objective methods of diagnoses as the X-ray, the electrocardiograph, vital capacity and the exercise tests are included.

The book ends with a final chapter on the care and management of the rheumatic child. This chapter the general practitioner will find of special value, because the author has carefully separated the grain from the chaff and critically evaluated the so-called "specific" therapy.

The Merck Manual of Therapeutics and Materia Medica. Seventh edition, 1430 pages. Rahway, New Jersey: Merck and Co., Inc.: 1940.

Merck's Manual is a handy reference for office use. Diseases are arranged alphabetically and concisely expounded under the headings of etiology, diagnosis, laboratory tests and therapy. Actual prescriptions are given. Many collaborators assisted in the authorship but individual chapters are anonymous. The nature of the book is such that discussion must be limited. Controversial points are avoided.

Minor parts of the book concern toxicology, posology and materia medica. These sections in the present edition have been stripped to devote more space to the encyclopedic discussion of various diseases.

Foreign Bodies Left in the Abdomen, by H. S. CROSSEN, M.D., of the School of Medicine, Washington University, and D. F. CROSSEN of the School of Law, Washington University; 762 pages; St. Louis: The C. V. Mosby Company: 1940.

Surgical scissors, hemostats, safety pins, sponges both of the sea and gauze variety, and laparotomy pads are among the items reported lost in the abdomen during surgery. The CROSSENS have collected 300 cases reported in the literature in the last 100 years. Discussed are the causes of foreign bodies being left in the abdomen, safeguards against this catastrophe, subsequent pathology, and the legal implications. Sponges are the chief offenders. The authors go into exhaustive detail describing operating room procedures to safeguard the sponge count. The book is of value chiefly as a reference work.

Textbook of Pediatrics, by J. P. CROZER GRIFFITH, M.D., Ph.D., emeritus professor of pediatrics in the University of Pennsylvania, and A. GRAEME MITCHELL, M.D., B. K. Rachford professor of pediatrics, College of Medicine, University of Cincinnati; third edition, revised and reset, 991 pages with 220 illustrations. Philadelphia and London: W. B. Saunders Co.: 1941. Price \$10.00.

Textbook of Pediatrics is a complete revision of the book *Diseases of Infants and Children*. The new title was chosen because the authors emphasize even more than in previous editions the characteristics of good physical and mental health, the prevention of disease, and the modern knowledge of growth and development. The book is decidedly an improvement over other editions and will interest teachers, students, pediatricians and general practitioners.

The authors present a valid excuse for the omission of a bibliography. "It is obviously impossible to include a complete bibliography for each subject, and it has seemed to us that an incomplete one would be only a gesture. Authors must, of course, keep up the struggle to survey the literature but they do not need to prove it by the insertion of a partial list of publications read." A bibliography for use with the textbook has been published in monograph form.

The first division of the book is devoted to general subjects. These include such subjects as: physical growth and development, physical hygiene of infants and children, mental and emotional development and mental hygiene, breast feeding, artificial feeding, symptomatology and diagnosis, and therapeutics. Division II is concerned with diseases. All diseases are discussed: diseases of the newborn infant; infectious or communicable diseases; general nutritional metabolic and miscellaneous; digestive system; respiratory tract; circulatory system; genitourinary system; nervous system; muscles, bones and joints; blood, spleen and lymph nodes; endocrine glands and allied subjects; and diseases of the skin, eye and ear.

Textbook of Pediatrics is a complete and accurate text which can be recommended without reservation to all readers of this special pediatric issue of JOURNAL-LANCET.

TRANSACTIONS OF
THE MINNEAPOLIS ACADEMY OF MEDICINE
 (Minneapolis Clinical Club)
 Founded January 17, 1920

Senior Meeting Held at the Minneapolis Club, Thursday, January 9, 1941
 Dale D. Turnacliﬀ, M.D., Chairman

**RECENT ADVANCES IN CHEMO AND
 SEROTHERAPY**

ERLING S. PLATOU, M.D.

The literature of the past year shows a continued effort toward solving the problem of mechanism of action of the sulfa drugs. Evidence has been presented in favor of several additional theories:

1. Oxidation (Shaffer) oxidation to the hydroxylamine which is the active form.
2. Anticatalase (Locke & Mellon). The drug interferes with the destruction of peroxide which then accumulates and exerts an antibacterial action.
3. Lockwood. The drug interferes with the normal metabolism of proteins by the organisms and produces its bacteriostatic effect in this way. This theory would explain the inhibitory action of peptone and the failure of sulfa drugs to act in the presence of large amounts of pus.

The past year has brought forth further evidence to show the relative specificity of certain sulfa drugs for specific organisms.

Whatever the mode of action of these drugs may be, it seems to be generally agreed that they do not in any way stimulate the production of antibodies. In fact, many case studies support the view that when chemotherapy fails few or no antibodies can be demonstrated in the host.

Experimental and clinical data to show the superiority of combined chemo and sero therapy have been presented.

In vitro pneumococcal tests (Spring, Lowell & Finland) showed that killing of pneumococci occurred more readily when specific serum and pyridine were used in combination than when either was used alone. Bullowa found the same to be true using bone marrow cultures. Fleming showed that whereas 25 mgm. of pyridine was insufficient to protect mice against 100 M.L.D. of type VIII pneumococci as was also a previous vaccination with killed pneumococci; when both procedures were employed all the animals survived. Apparently the combined effect was that of antibody protection and bacteriostasis. Keple and Gunn, and Parvell and Jameson found similar effects in pneumococcal studies in rats (except in type III). McLeod showed a synergistic effect of drug with serum in type III infections in mice.

Dowling, Abernathy and Hartman, studying human pneumococcus pneumonia used pyridine, serum and the combination alternately in the first eight types. In similar cases the results were found to be more favorable following combination therapy. Other reports on recoveries from pneumococcal meningitis also suggest that combined treatment is superior.

The use of the Francis skin test for determining whether a positive balance of antibodies is present has found favor with a number of clinicians. By this means an adequacy of actively produced or passively transferred antibodies is assured so that failure of chemotherapy because of antibody lack is avoided.

In the field of streptococcal immunity though advances in typing and serum therapy are not as well developed, progress has been made which seems somewhat analogous to the results in pneumococcal infection. Our own studies indicate that streptococcal convalescent serum contains protective antibacterial antibodies and is superior to the commercial streptococcal horse serums from this standpoint. It represents the closest approach so far attained to a type specific anti-streptococcal serum. In fact, pooling of this convalescent serum by type (there are 30 known types) is now being done in our serum laboratory.

In scarlet fever the combined therapy of this human convalescent serum and sulfanilamide has been found more effective than any other treatment hitherto employed.

In meningococcal infection in mice Branham has shown that combination therapy (serum and sulfanilamide) is much more efficacious than either one alone. The best results in humans have been obtained with pyridine and serum combined.

Combined sero and chemo therapy has recently been assayed in the much dreaded disease, influenzal meningitis. Josephine Neal has just reported 14 recoveries in 29 cases. Although only a small series, the previous reports with serum and chemotherapy alone have been very discouraging.

Of the diseases studied thus far it seems increasingly true that combination serum and chemotherapy, giving the advantages of antibody protection and bacteriostasis, is closest to the ideal in infectious disease therapy.

INSULIN AND METRAZOL THERAPY
 (Motion pictures, shown by Dr. Hewitt B. Hannah)

**RECENT ADVANCES IN OUR KNOWLEDGE OF
 THE AVITAMINOSES**

FREDERICK H. K. SCHAAF, M.D.

Before a less dignified meeting I should have preferred to entitle this discussion "Debunking the Vitamins," because these valuable substances have been so abused in the past that only carefully controlled clinical observations will enable us to evaluate their importance, and to state definite indications for their use. Fortunately, considerable progress has been made the past year to clarify the situation.

Three important facts have become apparent. The first is that the vitamins are of value, only in conditions where there is a proved or suspected vitamin deficiency. The only exception to this rule might occur in those few instances where large amounts of certain vitamins have been used and a non-specific therapeutic effect has been produced.

Second, practically all avitaminoses are multiple in character. Consequently, even if a particular substance is considered the specific vitamin responsible for the deficiency, in nearly all instances therapy with this substance alone is inadequate. This explains the necessity of employing high vitamin diets and crude vitamin-containing substances such as yeast.

Third, at the present time, we have no tests by which to diagnose deficiency states. Even the attempt to demonstrate a vitamin A deficiency with the bio-photometer in cases of night blindness has not been successful, as too many mistakes due to refractive errors or lack of personal adaptation occurred. Clinically we were also able to show that many of these deficiencies diagnosed in the laboratory did not respond to heavy therapeutic doses of vitamin A. It was likewise demonstrated that vitamin A is not the only factor in the formation of the visual purple in the retina, and during the past few months, it has been reported that certain cases of night or twilight blindness in the Dutch Indies responded only to the administration of riboflavin. I am sure that everybody is familiar with the need of vitamin A during childhood and early adolescence, but in the adult there are very few indications for its use except in nyctalopia and xerophthalmia.

It appears to be quite well proved that vitamin A is not the so-called anti-infection vitamin. Benefit from its use, either as a preventive or as a factor in increasing resistance, can be expected only in people on an actually deficient diet. I am sure there will be a great opportunity to study vitamin A deficiency in Europe, because in the first World War, when the Danes shipped their butter and butter fat to Germany, xerophthalmia became a common disease in Denmark.

As far as the B complex is concerned, vitamin B₁, or thiamine chloride, is the member of this group most widely used—used by everybody and for everything. It has been called the anti-

neritic vitamin. However, we are now suspicious that it is not an anti-neritic vitamin at all but acts indirectly through its important functions in the carbohydrate metabolism as a protective substance. It has been shown that pyruvic and lactic acid accumulate in great quantities when there is a deficiency of vitamin B₁. We have known for a long time that people on a high carbohydrate diet, for example the oriental diet, are particularly likely to develop symptoms of deficiency. But, clinically, the so-called alcoholic polyneuritis and the polyneuritis occurring in the excessive vomiting of pregnancy are most frequently seen.

There must be a great many cases of subclinical B₁ deficiency in postoperative cases because of the frequent use of glucose solution, and I feel certain that we shall realize the importance of this much more in the future. Deficiencies due to the lack of one or the other component of the B complex were quite frequently seen a few years ago when ill-conceived reducing diets were the vogue, and occasionally they occur without any apparent reason, perhaps because of the disturbed absorption of food from the intestinal tract. The fact that myocardial degeneration is frequently seen in beriberi, has led to the promiscuous use of thiamine chloride in cardiac disorders. I can truthfully say that I have seen patients who have been advised by physicians to discontinue the use of digitalis and take thiamine chloride instead. I am thoroughly convinced that only with the true beriberi heart can a specific effect on the heart muscle be expected. Personal studies in hyperthyroidism and myxedema hearts have convinced me of this conclusion. In diabetic neuritis thiamine chloride has given satisfactory results in only a limited group of early cases, perhaps because in other instances nerve degeneration had advanced too far.

B₂, riboflavin, is perhaps of more importance than we realize. It is the only vitamin that has a proved curative effect on certain eye manifestations of avitaminosis. Many deficiencies have been blamed for cataract and other eye conditions of obscure etiology, but there is no substantial proof. The lesions typical of riboflavin deficiency consist of cheilosis, an eruption at the mucocutaneous border of the lip, pigmented patches and fissures at the angle of the mouth and the naso-labial corner, and a peculiar vascularization of the cornea and pigmentation of the retina. These eye symptoms may occur singularly or in a group and as a rather uncomplicated deficiency. Twilight blindness also may be included in this group.

The value of nicotinic acid in pellagra is too well known to warrant very much discussion, but there are a good many problems connected with its use which need considerable clarification in the future. The picture of pellagra, especially, is often complicated by other deficiencies; and clinically a case will improve only to a certain point if we use the nicotinic acid alone.

B₆, pyridoxin, has been used during the past year very frequently in paralysis agitans; and while some encouraging reports have been published, I doubt very much that a carefully controlled series will prove this substance of any specific value. Perhaps the described results may be attributed to psychological or non-specific effects. According to Spears, some of the indefinite and vague symptoms in pellagra and beriberi, especially dizziness, fatigue, malaise, mental confusion, and difficulty in walking seem to clear up when pyridoxin is used in sufficient quantities.

Pantothenic acid and other members of the B complex are

undoubtedly necessary in the diet of the human being, but their exact role is not clear at this moment.

Vitamin C, ascorbic or cevitamic acid, may easily be demonstrated in the blood plasma or urine, but since all attempts to determine the human requirements or maintenance levels have been failures, we are in the dark as much as ever regarding subclinical or mild forms of this deficiency. Fully developed scurvy is not seen very often anymore. Saturation tests, made by administering a given amount of vitamin C and determining its elimination in the urine, may eventually be of some help; but individuals with subnormal or zero levels may be in perfect health.

Vitamin D in the adult is of use in only a few instances of nutritional osteoporosis or osteomalacia. Dihydrocholesterol is apparently the most effective of the ten known sterols in maintaining the calcium level in the blood. Massive doses of certain preparations, especially Ertron, have been recommended in the use of chronic arthritis, but my personal experience with it has been entirely unsatisfactory and inconclusive. What improvements have been obtained must be ascribed to some other therapeutic effect than correction of a deficiency. Caution appears to be advisable, although it is claimed that Ertron does not raise the calcium level in the blood and consequently may be less dangerous than other preparations.

A great deal of propaganda has been unleashed regarding the use of vitamin E in sterility, impotency, senility and various neuropathic disorders, such as amyotrophic lateral sclerosis. My clinical experience with this preparation is very limited, but scrutiny of various clinical reports does not warrant any great optimism. There seems to be no question, however, about its importance in the experimental animal as far as sterility in the male and habitual abortion in the female are concerned. In some of the favorable clinical reports hormones were used in connection with vitamin E, and consequently the conclusions cannot be accepted.

The use of wheat germ oil in multiple sclerosis and amyotrophic lateral sclerosis has not produced any results which may not be expected from nearsphenamine, sodium cacodylate, or any of the other preparations used in these conditions.

Vitamin K in the past year has fortunately been produced in injectable forms, which have made its use much more effective. Now a patient with obstructive jaundice can be converted into a good surgical risk within twenty-four hours; and bleeding in the newborn may be entirely preventable, although the importance of prothrombin deficiency as a causative factor of hemorrhage in the newborn and the routine use of vitamin K in mothers or infants is a controversial subject. The full importance of vitamin K will become known only after a satisfactorily accurate laboratory technic to show prothrombin deficiency has been developed.

To summarize: During the past year considerable progress has been made toward establishing definite indications for the use of various vitamin preparations. Their efficiency in actual deficiencies has been shown, and their inefficiency in other clinical disorders not associated with deficiencies is becoming more and more apparent. The greatest problem is the diagnosis of early or subclinical minor deficiencies; but, unfortunately, no progress can be reported in the laboratory tests proposed for this purpose. Only carefully controlled observations will help to clarify the rather confusing literature and prevent the enormous waste of money for unnecessary synthetic preparations.

ERNEST R. ANDERSON, M.D., *Secretary.*

Future Meetings

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

ANNUAL MEETING, MAY 18, 19, 20

Mitchell, South Dakota

PROGRAM

BUSINESS SESSION

Widmann Hotel

Sunday, May 18, 1941

4:00 P. M.—Council Meeting.

7:00 P. M.—House of Delegates Meeting. Address—President O. J. Mabee, Mitchell. Committee Reports. New Business.

Monday, May 19, 1941

Masonic Temple

4:45 P. M.—House of Delegates Meeting. Address—President-elect B. M. Hart, Onida. Election of Officers. Action on reports.

Tuesday, May 20, 1941

7:00 P. M.—Council Meeting.

SCIENTIFIC PROGRAM

Monday, May 19, 1941

9:00 A. M.—Orthopedic Clinic—Vernon L. Hart, M.D., Minneapolis, Minnesota.

10:00 — Surgical Clinic — Sumner L. Koch, M.D., Chicago, Illinois.

11:00—Intermission. Visit exhibits.

11:20—Pediatric Clinic—W. H. Thompson, M.D., Minneapolis, Minnesota.

12:20—Noon Intermission.

1:30 P. M.—“Heredity and Disease of the Skeletal System”—Vernon L. Hart, M.D., Minneapolis, Minnesota.

2:00 — “Insidious Loss of Vision”—Kenneth C. Swan, M.D., Iowa City, Iowa.

2:30—“The Medical Profession’s Responsibility in the Control of Cancer”—J. C. Ohlmacher, M.D., Vermillion, South Dakota.

3:00—Intermission.

3:30—(Subject to be announced)—Sumner L. Koch, M.D., Chicago, Illinois.

4:00—“Bleeding Tendencies in the New-Born and its Prevention”—W. H. Thompson, M.D., Minneapolis, Minnesota.

7:00—Banquet. Masonic Temple.

Tuesday, May 20, 1941

9:00 A. M.—Dermatology Clinic—Henry E. Michelson, M.D., Minneapolis, Minnesota.

10:00—Urology Clinic—Fredrick E. B. Foley, M.D., St. Paul, Minnesota.

11:00—Intermission.

11:20—Internal Medicine Clinic — James B. Carey, M.D., Minneapolis, Minnesota.

12:20—Intermission.

12:30—Medical Veteran’s Luncheon: Round Table Discussion—Robert G. Allison, M.D., Minneapolis, Minnesota. Bring your films for discussion.

2:30 P. M.—“The Relationship of Dermatology to General Medicine”—Henry E. Michelson, M.D., Minneapolis, Minnesota.

3:00—“Diagnosis and Treatment of Bladder Neck Obstruction”—Fredrick E. B. Foley, M.D., Minneapolis, Minnesota.

3:30—Intermission.

4:00—“The Progress of X-ray Technic”—Robert G. Allison, M.D., Minneapolis, Minnesota.

4:30—“Chronic Gastritis”—James B. Carey, M.D., Minneapolis, Minnesota.

5:00—Adjournment.

South Dakota Academy of Ophthalmology and Otolaryngology

Monday, May 19, 1941

9:30 A. M.—“Pathological Cysts in Special Reference to Naso-Pharynx”—J. A. Nelson, M.D., Sioux Falls, South Dakota.

10:30—Topic in Otolaryngology (to be announced)—Frank Bryant, M.D., Minneapolis, Minnesota.

11:30—“Advances in the Medical Treatment of Glaucoma”—Kenneth C. Swan, M.D., Iowa City, Iowa.

12:30—“Staphylococcal Ocular Inflammation”—J. H. Allen, M.D., Iowa City, Iowa.

NORTH DAKOTA STATE MEDICAL ASSOCIATION

1941 ANNUAL MEETING, MAY 19, 20, 21

Grand Forks, North Dakota

PROGRAM

Monday, May 19, 1941

Meeting of House of Delegates.

Annual Meeting of North Dakota Health Officers Association.

Evening Meeting, open to public. Main address by Dr. Morris Fishbein, Chicago, Illinois.

Tuesday, May 20, 1941

7:30—Committee Breakfasts.

8:30—Registration at Convention Hall.

9:00—Exhibits.

9:45—Paper: “Vitamins”—Dr. E. H. Rynearson, Rochester, Minnesota.

10:15—Intermission.

10:30—Symposium on Heart Disease: "Valvular Heart Disease"—Dr. Paul Rowe, Minot; "Cardiac Arrhythmias"—Dr. W. H. Long, Fargo; "Coronary Disease"—Dr. J. O. Arson, Bismarck; "Pathology of Heart Disease"—Prof. E. T. Bell, University of Minnesota.

12:15—Roundtable Luncheons. Subjects: "Renal Disease and Hypertension"—Prof. E. T. Bell, University of Minnesota. "Diabetes"—Dr. E. H. Rynearson, Rochester, Minnesota.

1:30—Moving Picture—"Traumatic Surgery of Extremities."

2:15—President's Address — Dr. C. J. Glaspel, Grafton.

2:30—Symposium on Traumatic Injuries: "Knee"—Dr. Edward Parnall, Minot; "Wrist"—Dr. H. J. Fortin, Fargo; "Ankle"—Dr. J. C. Swanson, Fargo.

3:30—Paper: "What the North Dakota Compensation Bureau Expects of the Physician"—Dr. W. H. Bodenstab, Bismarck.

4:00 to 11:00 P. M.—Golf, Informal Supper (Smorgasbord), and entertainment at the Grand Forks Country Club.

Wednesday, May 21, 1941

9:00—Moving Picture: "Vaginal Repair—Cystocele and Rectocele."

9:30 to 10:00—Paper: "Therapeutic Procedures in Chronic Rheumatoid Disease"—Dr. MacNider Weatherby, University of Minnesota.

10:00 to 10:15—Open.

10:15 to 10:30—Visit Exhibits.

10:30 to 11:00—Paper: "Cancer of the Large Bowel"—Dr. W. A. Fansler, Minneapolis.

11:00 to 11:30—Paper: "Diseases of the Skin"—Dr. H. E. Michelson, University of Minnesota.

11:30 to 12:00—Paper: "The Physician in the Selective Service Program"—Captain R. A. Bier, Medical Corps, Washington, D. C.

12:00 to 2:15—Roundtable Luncheons. Subjects: "Office Treatment of Ano-rectal Disease"—Dr. W. A. Fansler, Minneapolis; "Chemo-therapy"—Dr. M. Weatherby, University of Minnesota; "Common Skin Lesions of Office Practice"—Dr. H. E. Mickelson, University of Minnesota.

2:30 to 2:45—Paper: "Sex Hormones"—Dr. J. L. Conrad, Jamestown.

2:45 to 3:30—Paper: "Management of the Breech"—Dr. W. A. Coventry, Duluth, Minnesota.

3:30 to 4:00—Open Forum on Obstetrical Problems—conducted by Dr. Coventry, Duluth, Minnesota.

MONTANA STATE MEDICAL ASSOCIATION

The sixty-third annual session of the Montana State Medical Association will be held in Great Falls June 23, 24 and 25, with headquarters in the Rainbow Hotel.

Monday, June 23, will be given over to the meeting of the House of Delegates, the scientific session being held on the 24th and 25th.

The banquet will be Tuesday evening, June 24. Dr. Maurice L. Tainter of Stanford University will be the principal speaker at the banquet.

The Montana Academy of Oto-ophthalmology will meet in Great Falls June 22 and 23, and the Montana Public Health Association, June 26 and 27.

While only members of the House of Delegates are entitled to vote, matters of importance to every member of the profession will be taken up, and the privileges of the floor are extended to all members of the Montana State Medical Association.

Tentative Program

Dr. Emile Holman, professor of surgery, Stanford University School of Medicine, San Francisco, California: "Carcinoma of the Lung—its early symptoms and surgical treatment." "Carcinoma of the Stomach—its early diagnosis and treatment by aseptic resection of the stomach" (illustrated by lantern slides and a colored motion picture).

Dr. Donald King, associate professor of bone and joint surgery and head of division of bone and joint surgery, Stanford University School of Medicine: "Fracture of the Spine—its treatment and complications." "Fracture of the Upper Extremity."

Dr. Charles W. Barnett, assistant professor of medicine and head of division of syphilology, Stanford University School of Medicine: "Massive Dose Arsenotherapy in the Treatment of Syphilis." "The Prognosis and Treatment of Late Syphilis of the Cardiovascular System."

Dr. Davis A. Rytand, assistant professor of medicine, Stanford University School of Medicine: "The Management of Hypertension." "The Interpretation of the Newer Laboratory Methods."

Dr. Maurice L. Tainter, professor of pharmacology, Stanford University School of Medicine: "Chemo-therapy, including the Sulfanilamide Group." "Practical Applications of the Sympathetic Drugs, including Benzedrine."

News Items

The Seventh District Medical Auxiliary of South Dakota held their annual "Doctors Day" party in the recreation room at the St. Mary's Nurses' home in Sioux Falls recently. Mrs. Anton Hyden, president of the Seventh District Medical Auxiliary, introduced the program. The nurses' chorus sang "Doctors' Day," written by Mrs. F. C. Nilsson, and "Rockin' Time." Mrs. Hyden and Sam Keller, Jr., presented a play that was broadcast over the local station Sunday. This play, dedicated to the "Doctors", was also written by Mrs. F. C. Nilsson. It was decided that each state auxiliary to the American Medical Association choose its own date on which to honor the Doctors. South Dakota chose March 30th, to commemorate the discovery of the use of ether as an anesthetic in surgery.

Dr. Walter C. Daily, Grand Forks, North Dakota, has taken over the practice of Dr. F. O. Robertson who left with the medical corps of the 188th field artillery last month.

Dr. Ruth E. Boynton, president of the American Student Health Association, recently addressed the annual meeting of the Ohio Student Health association. She spoke on "The Responsibility of Health Services for Student Housing."

The annual two-day diagnostic clinic for physically handicapped persons living in six southeastern Montana counties was held April 14 and 15. Dr. L. W. Allard, Billings, was the examining physician.

Dr. Leo Conlin, formerly of Lake Elmo, Minnesota, is now practicing in North St. Paul.

Dr. N. J. Rognlien has purchased the practice and equipment of Dr. C. G. Johnson, with whom he has been associated for the past five years in Bemidji, Minnesota. Dr. Johnson is now in Duluth.

A grant of \$108,662 for continuing the operation of the heart convalescent ward for children at Lymanhurst hospital, Minneapolis, has been approved by WPA.

Five crippled children's clinics for Western North Dakota were held in April under the joint sponsorship of the Elks lodge and the North Dakota public welfare board. Children with physical handicaps of an orthopedic nature were examined.

Dr. R. D. Manchester has taken over the practice of Dr. K. E. Bray in Park Rapids, Minnesota.

Dr. H. A. Roust, city health officer of Montevideo, Minnesota, addressed the Montevideo Business and Professional Women's club recently on the trends in infant mortality, disease and higher standards in sanitary habits.

Dr. William R. Bagley, pioneer physician of Duluth, Minnesota, was named "first citizen" of 1940 at the annual Hall of Fame banquet held in Duluth recently. The American Legion sponsored the dinner.

Dr. Owen H. Wangenstein, head of the department of surgery, University of Minnesota Medical School, has been awarded the John Scott medal for outstanding achievement in medical science by the city of Philadelphia. The award includes \$1,000 in cash in addition to the medal.

Dr. Burton Mitchell, formerly of Deer Lodge, Montana, has moved to Ely, Nevada.

Dr. John Low, Mahanomen, Minnesota, is now in Fort Sam Houston, Texas, where he is serving as First Lieutenant in the U. S. Army.

Dr. Pattison A. Waters, chief medical officer at the Veterans hospital in Fargo, North Dakota, has become manager of that institution.

Dr. Leonard L. Sanford, director of the student health service at the University of Wyoming has resigned his position and will practice in Wisconsin.

A graduate course in Electrocardiography for physicians will be given at the Michael Reese hospital, Chicago, by Dr. Louis N. Katz, from August 18 to August 30, 1941. The course is open to both the beginning and advanced student in electrocardiography.

Dr. A. J. Swingle, Mandan, North Dakota, has become associated with Dr. C. C. Smith of Mandan.

Four Montana physicians have been appointed to carry on the NYA health program in south and eastern Montana. They are: Dr. R. D. Harper, Sidney; Dr. E. M. Adams, Red Lodge; Dr. B. C. Farrand, Jordan; and Dr. C. F. Hogeboom, Baker.

Dr. S. A. Weeks, formerly of Ambrose, North Dakota, has moved to Baker, Montana.

The following crippled children's clinics have been scheduled for May and June, according to the announcement of Walter W. Finke, Director, State Division of Social Welfare (Minnesota).

May 3, Willmar, serving Kandiyohi, Meeker, Renville, Chippewa and Swift Counties.

May 17, Thief River Falls, serving Kittson, Marshall, Pennington, Red Lake and Roseau Counties.

May 24, Austin, serving Mower, Freeborn, Steele and Dodge Counties.

June 7, Detroit Lakes, serving Norman, Mahanomen, Becker and Clay Counties.

June 14, Little Falls, serving Morrison, Todd, Mille Lacs and Crow Wing Counties.

Other districts in the state will be included in the fall schedule.

These clinics are for crippled children under 21 years of age whose parents are financially unable to obtain private orthopedic care. Services include: medical examination by an orthopedic specialist, vocational consultation, and arrangements for hospitalization and field nursing.

Coöperating with the Bureau for Crippled Children in this clinic program are the Minnesota-Dakota Orthopedic Club, the Gillette State Hospital for Crippled Children, the Division of Vocational Rehabilitation of the State Department of Education, and the Minnesota Public Health Association.

At the clinical meeting of the Montana Surgical Guild held in Great Falls, April 25-26, Dr. Fred H. Albee of New York city, famous orthopedic, bone and joint surgeon, was the principal speaker.

Dr. E. M. Larson, president of the Montana Tuberculosis association since 1934, was again re-elected at the annual meeting held in Helena April 19.

Dr. O. A. Bosshardt, Pondera county physician, Montana, has taken a leave of absence until July 1 to take a postgraduate course in surgery at the Los Angeles County General hospital.

Dr. L. G. Dunlap, Anaconda, Montana, recently presented a paper at a round-table regional meeting of the American College of Surgeons in Salt Lake City. His subject was "Injuries of the Face and Neck."

Dr. L. W. Larson, Bismarck, North Dakota, has been appointed to the board of directors of the American Society for the Control of Cancer. Dr. Larson is chairman of the state executive committee of the North Dakota division of the women's field army for the control of cancer.

Dr. A. C. Grorud, Bismarck, North Dakota, has completed his postgraduate study at the University of Wisconsin and has become associated with the Quain and Ramstad clinic in the department of internal medicine.

One hundred children were examined at the Elks-sponsored crippled children's clinic in Bismarck, North Dakota, in April. The state welfare board cooperated with the Elks to provide the clinic which served as a check-up for children who have been treated at hospitals.

The annual banquet of the Minnesota Medical Alumni will be held in connection with the state meeting in St. Paul, May 26. It will be a buffet supper served in the Casino Room of the St. Paul hotel. Mr. Clifton M. Utley, director of the Chicago Council on Foreign Relations, will discuss "America in a World at War." Price of admission will be \$1.50 per person. Tickets are on sale in St. Paul, Minneapolis, Rochester and Duluth and will also be available at the registration desk at the convention.

Dr. H. T. Frost, ear, eye, nose and throat specialist of Wadena, Minnesota, recently attended a short postgraduate course at Northwestern University, Evanston, and Cook County hospital, Chicago.

There will be an informal get-together of the alumni of the University of Minnesota Medical School at the American Medical Association Convention in Cleveland, Wednesday, June 4, 1941. This will be held in the Hotel Cleveland, from 5:30 to 7:30 P. M.

The Woman's Auxiliary to the Eleventh Northwest District Medical society was organized at Mobridge, South Dakota, April 27th. Mrs. B. M. Hart, Onida, and Mrs. E. A. Rudolph, Aberdeen, assisted in organizing the Auxiliary. Officers elected were: President, Mrs. C. S. Olsen, McIntosh; vice-president, Mrs. A. W. Spily, Mobridge; secretary and treasurer, Mrs. T. C. Totten, Lemmon.

Dr. Fred H. Wiechman, Montgomery, Minnesota, has joined the U. S. Army medical corps at Fort Riley, Kansas.

The Fourth District Medical Auxiliary met at the home of Mrs. T. F. Riggs, Pierre, South Dakota, on April 16th. A business meeting and open forum was held after which the time was spent socially. Mrs. I. R. Salladay, Pierre, was elected secretary and treasurer of the district auxiliary for the coming year.

The Sixth District Medical Society (North Dakota) met at the Bismarck Country Club, April 29, 1941. Dinner was served at 7 P. M. following which a program on cancer was presented: (1) "Cancer Control Program in North Dakota"—Dr. L. W. Larson, state chairman of the Committee on Cancer. (2) "X-ray and Radium Treatment of Cancer"—Dr. H. M. Berg, Bismarck, N. Dak. (3) Case Reports: (a) "Carcinoma of Ovary"—Dr. P. L. Owens, Bismarck; (b) "Horseshoe Kidney"—Dr. N. O. Brink, Bismarck. A business meeting followed the program.

The Second American Congress on Obstetrics and Gynecology

The Second American Congress on Obstetrics and Gynecology will be held in St. Louis, Missouri, April 6 to 10, 1942. All of the meetings and both the Commercial and Educational and Scientific Exhibits will be held in the Public Auditorium.

Adequate time for registration will be given the first day, before the opening of the sessions of the Congress. Admission to the Congress will be by individual membership card only. These may be secured by payment of the five dollar registration fee, any time after September 1, 1941.

Necrology

ELI LEWISON 1874 - 1941

Dr. Eli Lewison was born of pioneer parents on the prairies near Vermillion, South Dakota, in 1874. He died at Canton, South Dakota, April 6, 1941, at the age of 66, of bronchial pneumonia following influenza.

He was a graduate of Luther College, Decorah, Iowa, 1897, and of Rush Medical College, 1903. He began the practice of medicine at Toronto, South Dakota, in 1902, and in 1907 moved to Canton, South Dakota, where he enjoyed a successful practice until 1933, when he suffered a disabling attack of coronary thrombosis. This provided a baffling complication to the disease which caused his demise.

Dr. Lewison was a man of unusual abilities, a keen observer, and had rare good judgment, which, together with his sterling character found him with unbending loyalty to his patients, his friends, his fellow townsmen, his state and his country.

He was a life-long member of the Norwegian Lutheran Church, and an able and loyal contributor to its finances, its schools and its colleges.

ATTENTION SECRETARIES OF DISTRICT SOCIETIES

Space is at your disposal in *The Journal-Lancet* for advance notices and reports of meetings of your society and personal news items concerning members of your society. County and district secretaries are invited to forward such material to *The Journal-Lancet*, 84 S. 10th St., Minneapolis.

Classified Advertisements

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PRACTICE FOR SALE

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Minneapolis, Minnesota
June, 1941

Vol. LXI, No. 6
New Series

Simple Versus Radical Mastectomy in Carcinoma of the Breast*

C. W. Schoregge, M.D.†
Bismarck, North Dakota

THE subject of neoplastic disease of the breast is of importance because the mammary gland is one of the most common sites of malignant disease in women. Carcinoma of the breast, which is curable only when diagnosed early, has no early pathognomonic signs or symptoms. The most important consideration in its treatment is, therefore, its early recognition.

The title of this paper is a misnomer, but the object of it is to appeal to the physician to exert greater effort in attacking this disease. From the analysis of the cases under consideration, one will readily see that the results of our campaign to control cancer of the breast have been disappointing. The end results obtained by surgery have shown very little improvement since the introduction of radical mastectomy by Halsted in 1894. Women do not die of cancer of the breast, but of metastasis. The breast is subject to both benign and malignant diseases and furnishes us with a fundamental problem in the diagnosis and treatment of these conditions. Ordinarily, cancer of the breast is readily diagnosed, if there is a hard tumor infiltrating the surrounding tissues and attached to the overlying skin, which may be dimpled, a retraction of the nipple and palpable axillary glands. When this picture presents itself, it is self-evident that

no form of treatment can improve the percentage of cure.

The early diagnosis of cancer of the breast is difficult to make inasmuch as the time element, in so far as the patient is concerned, is only relative, existing only from the time she has discovered the tumor until she consults a physician. However, a lump in the breast, when it is clinically palpable, may be already in an advanced stage. When a patient over 25 years of age presents herself for examination because of a lump in the breast, the only course of procedure should be excision and immediate microscopic examination. Watching a tumor to see what will happen is to be condemned, as the only way to see is with a microscope. It is true that most cases are fortunately benign, but if malignant, this procedure will give the patient a greater chance for cure. In other words, when a tumor is clinically benign and found to be histologically malignant, it is an early diagnosis, and then suitable surgical treatment should be instituted immediately.

The campaign for the control of cancer has been advancing steadily, but in our community it has only come in waves. Certainly, it has brought us many breasts to be examined, but as yet it has not caused a reduction in the mortality of carcinoma of the breast. It must be remembered that we have three classes of individuals who have lumps in their breasts. The first is the highly

*Read before the North Dakota State Medical Association at Minot, May 7, 1940.

†From the surgical department of the Quain & Ramstad Clinic.

TABLE I.

	Total No. Cases	Without Axillary Metastasis				With Axillary Metastasis			
		No. Cases	3 Year Cures	5 Year Cures	10 Year Cures	No. Cases	3 Year Cures	5 Year Cures	10 Year Cures
Adenocarcinoma	9	5	4	3	3	4	3	2	
Medullary Carcinoma	11	3	2	1		8	4	1	
Paget's	1	1	1	1	1				
Scirrhus	32	21	15	11	6	11	4	2	
Scirrhus Carcinoma and Paget's	1	1	1	1					
Carcinoma Simplex	1					1			
Mixed Adenocarcinoma and Scirrhus	1	1							
Scirrhus Carcinoma and Intracystic Malignant Fibroadenoma	1					1			
Carcinoma in a Male	1					1			
Total	58	32	23 71.9%	17 53.1%	10 31.2%	26	11 42.3%	5 19%	

Total three year cures—58.6 per cent.

Total five year cures—38 per cent.

Total ten year cures—17 per cent.

neurological patient who is susceptible to any kind of stimuli and is the most difficult problem in diagnosis. It is from this group that the increased number of breast examinations come. Then, we have the more stable class of women who know that they have lumps in their breasts, but they do not suffer any pain and, therefore, just wait to see what will happen. The third class are women who know they have tumors and fear that when they consult a physician they will be told that they have cancer, so they consult neighbors and irregulars until their chances for a cure are at a minimum. It is on these last two types of women that we must impress the necessity for consideration of the pathology of the breast. Perhaps our line of attack has not been too diplomatic, as thus far the results have not been encouraging. Perhaps it would be wise to merely instruct all women with lumps in the breast that this condition is abnormal and requires immediate biopsy examination, not particularly stressing the word "cancer". There is no question that a continued education will, in time, bring better results than just waves of propaganda now and then, as we Americans like to be forgetful of anything that may disturb our mental happiness.

The following are some of the things that have been published in the lay press during the past month, which was designated as Cancer Control Month:

1. Cancer is a disorderly growth of body cells.
2. Cancer is the world's most democratic disease.
3. Out of 100 persons who die of cancer 60 are women.
4. In this country 150,000 persons a year die of cancer.
5. Cancer deaths could be cut to a third or a half.
6. Among men and women past 40, one out of ten will develop cancer.

7. Cancer incubates in silence and spreads in seclusion.

8. Early cancer is curable.

9. There is no proof that cancer is hereditary.

Now, if and when this increase of breast cases comes to the physician, has he prepared himself to meet the demands of the public? This, the individual can answer only for himself. The best results are obtained when the patient is taken to a hospital where a wide excision of the tumor is made and immediate microscopic examination performed. Waiting a week for a microscopic diagnosis, after a section of the tumor has been made, surely lessens the chances for a cure, if malignant. The physician should take warning, because the laity, by means of cancer propaganda and the distribution of pamphlets, is being fully instructed as to the ordinary diagnostic methods of early cancer. If we do not take notice, we will indict ourselves—and this may be another public health measure!

Unfortunately, the clinical and histological classifications do not assure the patient that he will survive a cancer death, nor do they indicate radiosensitivity or individual susceptibility to virulence. Broders' classification gives the surgeon a ray of hope for surgical success, but it does not insure the patient against a cancer fatality. It has not been fully explained why the same pathological growth will metastasize early in one individual and late in another, except that one is cancer sensitive and the other is cancer resistant. The biological reaction is different in each individual and it has been shown that the more malignant the cells are, the more readily they are attacked by irradiation. We must all agree with Gatch who states that the fate of the patient is sealed before she comes to operation.

I wish to present two series of cases of carcinoma of the breast. The first, reviewed by Dr. L. W. Larson in

TABLE II.
Age Incidence

	Simple Mastectomy	Radical Mastectomy
21 to 30 years	2	1
31 to 40 years	5	5
41 to 50 years	9	14
51 to 60 years	11	10
61 to 70 years	6	9
71 to 80 years	1	0
Total	34	39

TABLE III.
Pathologic Classification

	Simple Mastectomy	Radical Mastectomy
Adenocarcinoma	3	1
Carcinoma — Unclassified	1	1
Comedo-carcinoma	2	
Ductal Carcinoma	1	1
Ductal Carcinoma with Paget's Disease of the Nipple		1
Medullary	3	9
Papillary Intracystic Carcinoma	1	
Sarcoma	1	
Scirrhus	22	26

1934, includes 58 cases which were followed prior to 1931 and another group of cases which we were able to follow from 1930 to 1940. The two groups comprise 131 cases.

Table I tabulates the 58 cases, however few, and represents the type of malignancy and the end results comparable to reports from well known clinics in more densely populated communities. The chart represents all malignancies of the breast with and without metastasis. In those without metastasis 71.9 per cent were alive at the end of three years; 53.1 per cent at the end of five years; and 31.2 per cent were living at the end of the ten year period. The malignancies with metastasis comprise 50 per cent of this series; at the end of three years 42.3 per cent were living and at the end of five years 19 per cent. The total number of both living at the end of three years was 58.6 per cent; at the end of five years 38 per cent, and at the ten year period only 17 per cent. These are the end results obtained by radical operation, which has been standardized according to the principles of Halsted. The results have not been encouraging. One would almost think that a localized disease easily examined should show better results.

In the past ten years we have operated on 208 tumors of the breast of which 73 were malignant. There were three individuals who had bilateral involvement of the breast; three were clinically benign, but proved to be histologically malignant at the time of biopsy. All other cases were clinically malignant and the diagnosis was confirmed by frozen section at the time of operation.

On account of the disappointing results we had obtained by radical mastectomy, a controversy concerning the treatment of this disease arose in our group. Since reports from Grace,² McNealy⁷ and others demonstrated that they obtained equally as good results with simple

TABLE IV.
Treatment in Carcinoma Breast

1. Resection of breast (a) Radical (b) Simple mastectomy, method of McNealy
2. First series X-ray therapy 5 to 10 days following surgery
3. Second series 2 to 3 months after first series
4. Each series give about 1100 r in air over 10 day period to entire anterior chest wall of the affected side, including xyphoid area, axilla, supraclavicular and cervical regions. Give about 500 r to posterior axilla. Give about 300 r extra to anterior axilla and supraclavicular areas
5. Many centers advocate sterilization by X-ray in patients who have not passed the menopause.

TABLE V.
Results

Length of Time Since Surgery	Simple Mastectomy	Radical Mastectomy
Under 1 year	1	1
1 year	5	2
2 years	3	1
4 years	5	1
5 years	2	2
6 years		3
7 years	1	4
8 years		1
9 years		5
10 years		1
No recent follow-up reports	4	3
Deaths	13	15

mastectomy as with the more radical procedure, we have followed McNealy's method with the exception that all cases are treated postoperatively with two series of irradiation. Our cases are divided about equally between the conservative mastectomy and the standardized radical. It is not our purpose to discredit the radical operation, but no surgical procedure is orthodox. In simple mastectomy, as performed by us, the conservative treatment consists of removal of the breast with or without removal of the pectoralis fascia and removal of palpable nodules. This does not include complete dissection within the axilla. I do not care to discuss the technical difficulties in mastectomy, but the breast, on account of its peculiar anatomy, should not be removed through too small an incision, as one is too apt to leave residual breast tissue. Therefore, all patients should be prepared in the same manner as for a radical operation and the incision should be made to include a wide margin of healthy tissue and should be extended to the floor of the axilla.

Table II shows that the highest incidence occurred in the fourth and fifth decades. From this one is impressed with the fact that carcinoma does occur in patients under 30, and it is in these cases that the error in diagnosis is often made.

Table III shows the pathological classification of all breast carcinomas with the type of surgical procedure followed in each instance. Fortunately, most of these were of the scirrhus type which is usually slow growing. It is in this type that we see the retracted nipple and the skin undergoing an orange-like dimpling. Sarcoma is the least often found.

TABLE VI.
Analysis of Deaths Following Radical Mastectomy

Cause	Diagnosis	Length of Time Postoperative
1. Melanoma arm with metastasis	Scirrhus	4 yrs.
2. Influenza	Adenocarcinoma	3 yrs.
3. Arteriosclerotic heart disease	Ductal carcinoma	5 months
4. Metastasis to lungs	Scirrhus—metastasis	6 yrs.
5. Metastasis to lungs	Medullary—metastasis	5½ yrs.
6. General carcinomatosis	Scirrhus—metastasis	2½ yrs.
7. Metastasis to femur (pathological fracture)	Medullary—metastasis	2½ yrs.
8. Metastasis to lungs	Scirrhus	2½ yrs.
9. Metastasis to lungs	Scirrhus—metastasis	1 yr.
10. Metastasis to spine	Scirrhus—metastasis	1 yr.
11. Metastasis to lungs	Scirrhus—metastasis	1 yr.
12. Metastasis to lungs, liver and humerus	Medullary—metastasis	1 yr.
13. Metastasis to lungs	Medullary—metastasis	6 months
14. Metastasis to lungs and abdomen	Scirrhus—metastasis	3 months
15. Metastasis to brain and hip	Scirrhus—metastasis	2 months

TABLE VII.
Mortality Rates

Simple Mastectomy:	
Number of Cases	34
Deaths due to carcinoma breast	11
Mortality rate	32.3%
Radical Mastectomy:	
Number of Cases	39
Deaths due to carcinoma breast	12
Mortality rate	30.8%
Mortality rate in both series—31.5% (23 deaths in 73 cases)	

Table IV outlines the plan of treatment followed in the 73 cases.

It is difficult to evaluate the results of irradiation. However, we know, from our own experience, that palpable nodules have disappeared under this treatment. All the treatment has been directed by Dr. H. M. Berg, in charge of our department of radiology. It should always be fully explained to each patient what she may expect before the treatment is begun. We have had some marked postirradiation reactions, such as nausea and vomiting with marked skin reaction. We, also, have had postirradiation fibrosis of the lungs in varying degrees, fibrosis of the pectoralis muscle and lymphedema of the arm, but the latter seems to be only temporary.

In a recent address, Adair of Memorial Hospital, who is a strict adherent to radical procedure, stated that post-irradiation in breasts without metastasis did not increase their five year survival, but where there was metastasis, it increased their five year cures 6 per cent.

Table V tabulates all the cases as to the length of time since surgery and the type of surgical treatment instituted. There is a disproportion of figures due to the fact that radical mastectomy had precedence over the conservative type of treatment until five years ago. We were able to have recent follow-up reports in all except four cases in the simple mastectomy group and three in the radical. There was a total of 28 deaths; 23 died

TABLE VIII.
Analysis of Deaths Following Simple Mastectomy

Cause	Diagnosis	Length of Time Postoperative
1. Hypertensive heart disease	Scirrhus	2 yrs.
2. Arteriosclerotic heart disease	Scirrhus	2 yrs.
3. Metastasis to lungs	Scirrhus	2½ yrs.
4. Metastasis to lungs	Scirrhus	2 yrs.
5. Metastasis to lungs	Scirrhus	2 yrs.
6. Metastasis to lungs	Scirrhus	2 yrs.
7. Metastasis to lungs, liver and peritoneum	Scirrhus	1½ yrs.
8. Metastasis to lungs and abdomen	Comedo-carcinoma	15 months
9. Metastasis to lungs	Adenocarcinoma	8 months
10. Metastasis to lungs	Scirrhus	8 months
11. Metastasis to lungs	Ductal carcinoma	4½ months
12. Metastasis to lungs (axillary metastasis at operation)	Scirrhus (bilateral)	4 months
13. Metastasis to liver and peritoneum	Scirrhus	4 months

of recurrent carcinoma and 5 died of other diseases. We had no immediate postoperative mortality.

Tables VI and VII give the causes of death and the length of time the patients lived postoperatively. Comparative study of the two tables shows that the most common site of metastasis is in the chest. Table VI shows that nearly all had lymphatic involvement at the time of operation, but on account of the conservative treatment, we were unable to accurately estimate the lymphatic involvement in the cases shown in table VII. The average length of life following radical mastectomy was 24 months and in the conservative type of treatment 15 months. Here, again, there is a slight discrepancy, as the radical procedure was carried out over a longer period of time. However, I firmly believe that all those who survive the two year period with the conservative type of treatment will live as long as those who have had radical procedure.

Table VIII tabulates the mortality rates which are approximately the same in both types of surgical procedure.

The following group of cases are some of the patients on whom we have performed a conservative mastectomy followed by two series of postoperative irradiation. Recently, these patients were given physical and X-ray examinations for evidence of metastasis and these were found to be negative.

Case 1. The patient, age 37, married, reported for examination because of a lump in the breast which had been present for two months. She had been treated with hot packs without results. The tumor was located in the left lower outer quadrant; the skin was adherent and there was dimpling. A clinical diagnosis of carcinoma of the breast was made and confirmed by frozen section at the time of surgery (scirrhus). This patient had fibrosis of the pectoralis muscle and some lymphedema of the arm due to her X-ray therapy. The length of time since surgery and irradiation is 1½ years. (Fig. 1.)

Case 2. This patient, age 64, married, reported for an examination on account of a tumor in the right breast of one month's duration. She also had hypertensive cardiovascular disease with diabetes mellitus. One year later she reported for re-examination because of a tumor in the left breast which had been there for two months. The right breast tumor was medul-



Fig. 1. (Case 1.) Appearance 1½ years after mastectomy for scirrhus carcinoma.

Fig. 4. (Case 4.) Appearance 4 years after mastectomy for adenocarcinoma.

Fig. 7. (Case 7.) Appearance 4 years after mastectomy for scirrhus carcinoma.

Fig. 2. (Case 2.) Appearance 1½ years after mastectomy for medullary carcinoma, right breast, and scirrhus carcinoma, left breast.

Fig. 5. (Case 5.) Appearance 4 years after mastectomy for scirrhus carcinoma.

Fig. 8. (Case 8.) Appearance 5 years after mastectomy for scirrhus carcinoma with metastasis.

Fig. 3. (Case 3.) Appearance 2 years after mastectomy for scirrhus carcinoma.

Fig. 6. (Case 6.) Appearance 4 years after mastectomy for comedocarcinoma.

Fig. 9. (Case 9.) Appearance 5 years after mastectomy for a mixed scirrhus and medullary carcinoma.

lary carcinoma and the left was scirrhus and not metastatic. The length of time since surgery is 1½ years. (Fig. 2.)

Case 3. Age 44, married. She reported having a tumor in the lower right quadrant for a long time. Because of its definite clinical signs three months before reporting for treatment, a diagnosis of carcinoma was made. The picture will show a mild lymphedema of the arm due to irradiation. The length of time since surgery is two years. (Fig. 3.)

Case 4. This patient, age 38, single, came to the clinic for examination because of a tumor in her breast which had been there for two years. Previously, she had had several courses of X-ray treatment, but had received no relief from weeping and bleeding of the nipple. This picture shows her four years after operation. The diagnosis was adenocarcinoma. (Fig. 4.)

Case 5. This patient, age 67, married, had hypertensive cardiovascular disease. She had noticed a tumor in the breast for two months; it was located in the right upper quadrant. This proved to be a scirrhus carcinoma. The length of time since treatment is four years. (Fig. 5.)

Case 6. Age 29, married. She had noticed a tumor in the breast five months previously. It was located in the upper, outer quadrant. A diagnosis of comedo-carcinoma was made. The photograph shows marked telangiectasis in the supraclavicular space where the mass was given extra heavy irradiation. The length of time is four years. (Fig. 6.)

Case 7. Age 54, married. The tumor in the breast was clinically benign and histologically scirrhus carcinoma. The length of time since surgery is four years. (Fig. 7.)

Case 8. Age 29, single. She had had a tumor in the breast for only a short time. Clinically, the tumor was movable and the diagnosis was questionable. The glands along the pectoralis muscle were removed after confirmation of the diagnosis of scirrhus carcinoma; these showed metastatic carcinoma. The length of time since surgery is five years. (Fig. 8.)

Case 9. Age 75, widow. She had noticed a lump in her right breast for two days. The mass was situated at nine o'clock and was 2 centimeters in diameter. There were no palpable axillary nodes. Conservative mastectomy was performed. Histological examination showed a mixed scirrhus and medullary carcinoma. In 1936 she developed a squamous cell carcinoma of the roof of the mouth which was treated with radium. At her recent examination this was entirely healed. The length of time since mastectomy is five years. She is now 81 years of age and is symptom free. (Fig. 9.)

It is evident from the tremendous number of contributions that have appeared on the subject of carcinoma of the breast, that surgical treatment is not one of idealism and that the behavior of the individual cell is a very deciding factor in its cure. Not until we learn more about the biological factors will we be able to determine a more definite therapeutic procedure. Cyclotron experiments at the University of California, though still in their infancy, have shown some gratifying results and,

if proven successful, will outweigh any other material contribution.

However, we must use all of our armamentarium at hand, even though not strictly surgical, in an attempt to conquer this disease. From this meager statistical analysis no definite conclusions can be reached. However, one surely ought to consider results from conservative mastectomy and irradiation, especially in cases where there are other disabling factors, such as, age, debility, cardiovascular disease, asthma and others, which will not allow more radical treatment.

The results of conservative mastectomy seem somewhat encouraging, even though this is only a preliminary analysis. We shall continue this comparative study in

our community and hope that five years hence we can present more definite conclusions.

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Artificial Pneumothorax in the Treatment of Tuberculosis of the Lungs*

Its Indications and its Complications

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PNEUMOTHORAX artificially introduced for the treatment of pulmonary tuberculosis has saved the lives of thousands of individuals since its inception. Its use in the rural areas of the country has been rather limited. Its extensive use in South Dakota has been of recent date. The procedure is mechanically simple to perform. Its effect on the body is difficult to understand. However, I will attempt to discuss briefly these two phases of artificial pneumothorax.

Normal respiration¹ depends on the proper coördination of three functional systems: (1) lungs, including bronchi, trachea and upper respiratory tract (2) pulmonary circulation (3) thoracic walls.

Pulmonary tuberculosis impairs the function of the pulmonary parenchyma by impairing the hemo-respiratory exchange. This reduces the available breathing surface. Healthy lungs can compensate for this to a great extent. When pulmonary tissue is rendered impermeable to gaseous exchange, and when pulmonary circulation continues through such tissues, a functional imbalance is created for which no compensation is possible. Normally, the oxygen-saturation of the blood in the pulmonary vein and in the arterial blood of the systemic circulation is almost complete. Therefore, no degree of hyperfunction can compensate for unsaturated blood that comes from non-breathing tissue. The mixture of fully saturated blood and of unsaturated blood will be deficient in oxygen and some degree of anoxemia will result.

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In addition, pulmonary tuberculosis may produce further functional impairment by pleural effusions, adhesions, intrabronchial secretions, bronchial stenosis and obstruction, emphysema, atrophy or paralysis of respiratory muscles which are secondary to the infection. Besides that, those factors which are manifestations of constitutional disease as: fever, tachycardia, circulatory disturbances and anemia may also produce functional impairment.

Physiological responses to collapse therapy are those which are produced by the collapse itself and those which are produced by the response of compensation to the collapse. The response of compensation may overshadow the phenomena of the defect produced. The defects produced by the collapse are: (1) decrease in total pulmonary volume, (2) decrease in vital capacity, (3) increase in intrapleural pressure. These are only enumerated here and no time will be taken to explain their effect. The compensatory mechanisms are, or may be: (1) muscular compensation (increase in auxiliary respiratory muscles), (2) increase in rate of respiration, (3) increase in oxygen absorption, (4) increase in pulmonary circulation, (5) decreased pulmonary circulation, (6) increase in oxygen carrying capacity of the lung by increasing hemoglobin, (7) hypertrophy of right heart, (8) emphysema, and (9) change in the blood chemistry. This brief resumé of the physiological principles involved in collapse therapy has been given so that the procedure may not be looked upon as one of no consequence and of little responsibility.

Much of the pathology of pulmonary collapse will not be included in this paper. It should be stated, however, that a cavity may be healed roentgenologically and clinically when pathologically such a state is rare indeed.

The factors which seem to contribute to the curative effect of pulmonary collapse are: (1) an elastic relaxation, (2) relative rest of the part involved, and (3) compression of diseased tissue or cavities, (4) compression of bronchi and tortuosity of same makes less favorable a bronchial spread; (5) an unexplained factor (possibly relative anemia) that prevents focalization of blood born bacilli (6) decreased lymph flow reduces toxic symptoms; and (7) possibly the relative anoxemia and lymph stasis may enhance fibrosis. This is not proven.

So much for the physiology and pathology which could fill a large volume. Pneumothorax in the treatment of tuberculosis is probably the greatest single advancement ever made to date in the treatment of the disease. That it is not used more in certain localities is a pity. That it is not understood more by many who are using it is a natural consequence. It is a procedure to be used toward one end only—that of controlling the signs and symptoms of pulmonary tuberculosis, and of putting the lung in the most favorable condition for healing. Unless it does this continuously it is not satisfactory. The procedure in itself is of no value unless it accomplishes those things. The use of pneumothorax in the treatment of pulmonary tuberculosis and the complications possible constitute the text of this paper.

ESSENTIAL EQUIPMENT

There are a few essentials in the matter of equipment. First of all it is necessary to know what you are trying to accomplish with the procedure. It should be stated that, inasmuch as the pneumothorax is to be used to keep the pulmonary tissues compressed so there is rest, a more or less steady pressure is ideal. It is no economy to lengthen treatment interval and increase volume of refill. To do that defeats the whole purpose of the collapse—rest of the lung. A more or less constant compression accomplished by the proper pressures with the ideal amount of refill is the end strived for. Large refills compress the lung (or push it into the other hemithorax) and a long time interval allows it to expand and reopen any cavities which might be closed. A pressure around atmospheric or slightly less usually gives the most satisfactory results. Only rarely does a pressure above atmospheric become necessary.

Secondly, artificial pneumothorax is a surgical procedure and care against infection should be taken accordingly. A FLUOROSCOPE IS IMPERATIVE FOR THE SAFE ADMINISTRATION OF ARTIFICIAL PNEUMOTHORAX. It is impossible to know what is taking place without this equipment. A patient should be fluoroscoped before and after a refill to know how the lung is reacting. Many times a refill is postponed; many times the period between refills is shortened. A pendulous mediastinum may cause serious consequences. A fluoroscopic examination after the refill with an aspiration of air, if needed, may avoid this and other serious consequences.

Any apparatus that will give stated amounts of air and will record the pressure within the pleural space is adequate as far as the pneumothorax machine is concerned. The State Sanatorium makes up outfits for anyone interested, and sells them at cost—about \$5.00. By the way, the Sanatorium still holds open its standing invitation for any physician in the state to come and spend a week or two if he wants to learn about pneumothorax or wants to learn a little more about pulmonary tuberculosis.

Artificial pneumothorax as a method for treating tuberculosis does not supplant sanatorium care. Too often is it thus used. This procedure should be used to enhance that care. A critical study of pneumothorax as used in Chicago¹ on sanatorium patients and ambulant patients when beds are not available gives a very good answer to whether or not it makes any difference. In a study of some 8,000 cases, it was found that there was a survival rate of 66.5 per cent of those patients treated in the clinic as ambulant patients and of 75.9 per cent of those patients treated in the sanatorium. It was also found that where there was a sequence of collapse measures the results were still better. In other words, collapse therapy of pulmonary tuberculosis is most successful when it is dealt with as a sequence of different collapse measures. This same thing has been brought out in other works to be mentioned later.

INDICATIONS FOR THE USE OF ARTIFICIAL PNEUMOTHORAX IN THE TREATMENT OF PULMONARY TUBERCULOSIS

1. In a general statement, it may be said that pneumothorax should be tried on any case of pulmonary tuberculosis when the disease is progressive no matter how small the lesion.
2. I believe it should be used if there is a demonstrable cavity, or
3. When the sputum is positive persistently without a demonstrable cavity.
4. It may be used to control hemorrhage.
5. In clear pleural effusions the fluid should be removed and be replaced with air while the fluid is examined for tubercle bacilli. Guinea pig inoculation or culture might be needed to demonstrate the presence of these bacilli. A clear pleural effusion without apparent cause is more frequently a manifestation of active tuberculosis than not. A cushion of air around the lung while waiting for a diagnosis of tuberculosis may mean the difference between an easy control of tuberculosis with a pneumothorax and a thoracoplasty. Disadvantages of this treatment will be discussed in accidents of pneumothorax.

It would be a wonderful thing if all cases which seem to be suitable for treatment with pneumothorax could be so treated. As a matter of fact, a small percentage are amenable to collapse by this method. In a study made at Glen Lake Sanatorium² over a 20-year period, 1,027 cases were considered suitable for pneumothorax. This consisted of about one-third of the pulmonary cases treated during this time. Of the group, there were 249

cases (about 24 per cent) in which no free pleural space was found, 346 cases (33 per cent) which were considered unsatisfactorily collapsed and were abandoned, 110 patients (10 per cent) in which the collapse was deemed partially satisfactory, and 321 (32 per cent) in the satisfactory group. It is thus seen that out of the group thought suitable for pneumothorax, one out of four had no free pleural space and only one out of three got satisfactory results. I quote the figures from this study as it includes a great many cases thoroughly studied. At our own Sanatorium pneumothorax as a method of treatment is a relatively new thing and a large group has not as yet been collected.

For the last three years in our own institution—years since any records are available—we find that about 28 per cent tried pneumothorax. We find 9 per cent abandoned because of unsatisfactory collapse and no free pleural space. In our own group, we have tried a smaller percentage and have had fewer failures. It thus becomes apparent that the success or failure of a pneumothorax makes a great difference in the prognosis of the case; about one-third of cases admitted to the sanatorium are considered suitable for pneumothorax trial. About one-third of these get satisfactory results. The others need other types of surgery. Another 20 per cent of those cases which get a satisfactory collapse have some complication which requires abandonment of pneumothorax and substitution of other forms of collapse. In the study above mentioned it is well to note that other surgery formed a very valuable service to the patients who could not get pneumothorax. A study made after three years of the groups who could get no collapse with pneumothorax and the groups who had unsatisfactory collapse showed that of those in these groups who had no further surgery 74.6 per cent were dead while of those who had further surgery only 28 per cent were dead. It is thus seen that abandonment of pneumothorax must needs be followed with other forms of collapse. Any discussion of pneumothorax leads to a mention of other forms of collapse procedures.

The indications for attempting pneumothorax have been enumerated. The contraindications may be listed as: (1) Too great an extent of infection, making it certain that to control the infection not enough functioning lung would remain. (2) Emphysema may be a contraindication for the same reason as the last mentioned. (3) Asthma may come under the same heading. (4) Tuberculous lesions in the mucosa of the trachea and bronchial tubes. (5) When extrapulmonary tuberculous infection is threatening the life of the patient it would be unwise to resort to pneumothorax even though it were indicated as far as the lung is concerned. (6) Some insist that an acutely ill patient should not be started on pneumothorax. It requires judgment to decide when is the optimum time for starting a pneumothorax in such a case. To delay may mean an adherent lung. To start too soon will probably mean a massive effusion with its consequences. (7) It may be that a highly excitable patient would be a contraindication. Perhaps a permanent procedure would be better.

(8) A severe anemia would best be corrected first as severe dyspnea might require abandonment anyway. (9) Those patients who for some reason or other are not coöperative (insane, etc.) will probably come to abandonment sooner or later or terminate in some disaster and probably would be best not started. (10) Most certainly terminal cases should not be subjected to this procedure. Many variations of the above may make additional contraindications. At times certain extenuating circumstances might cancel some of the above contraindications.

COMPLICATIONS

Pneumothorax is by no means a simple and harmless procedure. Many complications may be encountered which will cause abandonment of the procedure. Some complications may cost the life of the patient.

Subcutaneous emphysema may be caused by not having the needle in the pleural space or by creating too high a positive pressure within the pleural space. These high pressures are not recommended. Some men have deliberately created high positive pressure in an attempt to stretch or break adhesions. That they have not been successful has been a blessing to the patient. When such a procedure is attempted accident is courted. If an adhesion breaks it very likely would cause a pressure pneumothorax from a tear in the lung. It would probably cause an effusion which would be purulent. If an adhesion is causing an otherwise satisfactory collapse from being satisfactory, it should be cut. If not amenable to section, the pneumothorax should be abandoned and thoracoplasty substituted.

Subcutaneous hemorrhage may be induced by a puncture of a large vessel when the needle is inserted into the skin. Care should be exercised to avoid any such vessels that are visible. Hemorrhage into the pleural space is not unknown. An intercostal vessel punctured might cause this. Pneumoperitoneum is not an uncommon accident when a puncture site is too low in the chest. Puncture of an abdominal viscera is not impossible. Administration of pneumothorax on the wrong side by mistake is not unknown. These few complications are probably minor in importance and infrequent in occurrence. It is conceivable that they might be of importance.

After a long standing collapse or following an effusion, a lung may not expand. This is not so serious as long as the pneumothorax is satisfactory. In case a pyopneumothorax develops it may make a closure of the pus-pocket almost impossible.

Pleural shock is a complication that is described by some and denied by others. It may be described as "characterized by pallor, dyspnea, weak pulse, cyanosis and syncope." It is relatively rare. Others insist that this is an indication of air embolism. Air may enter an opened vein from the pleural cavity. Symptoms develop rapidly and startlingly. Collapse is sudden and may be fatal. It has been estimated that this occurs once in 500 to 1,000 refills by some; once in 30,000 by others. At Glen Lake³ this has happened twice in about

75,000 refills, and both of these happened about 50,000 refills ago. It appears that as experience in the procedure is developed this accident is more rare. No definite figures are available at our own institution but we have had two such cases which occurred in the first 1,000 of about 8,000 refills in three years. There is about a 50 per cent mortality in this accident. It may be guarded against by insisting on good fluctuation of the manometric pressure before starting the flow of air.

Accidental pneumothorax is one of the more frequent complications or accidents in the administration of artificial pneumothorax. It is by no means diagnosed every time it happens. There is no doubt that on the initial puncture for a pneumothorax, accidental puncture of the lung happens frequently. Some have gone so far as to say they believe that every pneumothorax is started with accidental puncture of the lung. I do not believe this to be a fact. It does not seem to me that using a regular rounded starting needle it is possible that the lung is punctured.

A series of cases have been tried at South Dakota Sanatorium to demonstrate that the lung is punctured. This was done some time ago. At that time a rounded needle was not used, but a sharp one with a short bevel. The usual procedure was carried out as to infiltrating with novocaine and the pneumothorax needle was inserted to get a manometric reading. Then without injecting any air, a film was taken of the chest the next day. There was visible a small pneumothorax pocket in almost 100 per cent of the cases. I do not think this proves that all pneumothoraces are started with an accidental puncture of the lung. What it does demonstrate, I think, is that more care should be taken in infiltrating with novocaine and initiating pneumothorax.

Accidental pneumothorax is diagnosed more often in bilateral cases. There are very definite reasons for this. In the first place, the lung is usually carried under less compression to allow for sufficient functioning lung. Thus, the lung is nearer the chest wall and is more susceptible to puncture if extreme care is not taken. In the second place, when accidental pneumothorax takes place in a bilateral case, the resulting progressive spontaneous collapse of the lung brings on symptoms much more readily. The patient is working on a limited capacity anyway and when this small reserve is suddenly dissipated, very definite and alarming symptoms develop.

In either the unilateral or bilateral pneumothorax cases it is necessary to remove the excess air. It may be necessary continuously to remove air until the wound in the lung is healed over. In the bilateral case it frequently requires immediate and rapid removal of air to alleviate symptoms of anoxemia and displacement of the heart and large vessels. If this is not done death soon ensues. It sometimes becomes necessary to insert a catheter into the chest and put on continuous suction to relieve the symptoms. At times a catheter inserted and left open to the atmosphere will prevent a continued compression of the lung. As the air leaks out of the lung, the pressure is kept down by spilling to the outside. This should be used only as a temporary procedure, however. If a

connection to this catheter is carried into a vessel of water it will act as a "pop valve" to release excess pressure. The pressure can be governed by the depth of the water. When the pressure gets too high air will bubble out of the tube. If the pressure is reduced, water will rise in the tube to compensate and thus keep a relative predetermined pressure.

MOBILE MEDIASTINUM

The mediastinum frequently is not fixed and is shifted with the pneumothorax and care must be taken that it not cause an upset in the respiratory or circulatory functions. Mediastinal hernia may be considered a complication of pneumothorax. That it occurs is due to one of two weaknesses in the mediastinum. One such place is anterior and above and the other posterior and below. It appears that more herniae take place in the anterior weak spot. It is diagnosed either by X-ray or fluoroscope. In the latter case an area of increased aeration is noticed in the upper portion of the contralateral lung at the mediastinum, which increases in size on expiration. This causes no particular symptoms and the only cure is abandonment of the pneumothorax. This procedure is not necessary or recommended, however.

Broncho-pleural fistula may develop over a pneumothorax. This is usually a cause of spontaneous pneumothorax but could occur over a pneumothorax. Such a complication, of course, would call for abandonment of pneumothorax if possible and other surgical procedures instituted.

Adhesions, while not due to the pneumothorax, may be considered as a complication of the procedure as it is the greatest single cause for the discontinuance of artificial pneumothorax. Adhesions are caused by inflammation of the pleura. It is thus seen that this complication can be expected in any tuberculosis case of much extent or duration. It can be predicted, but with no certainty. Trial pneumothorax is the only way to tell what case has adhesions and what their extent. It can be seen that if pneumothorax is tried early there is less liability that this complication will be met. This, perhaps, is the greatest argument for starting pneumothorax early on active progressive pulmonary tuberculosis. Not infrequently, adhesions seal the entire pleural space making pneumothorax impossible. This is a very great argument for replacing aspirated pleural fluid with air. An obliterative pleuritis frequently forces abandonment of an established pneumothorax. The lung is gradually pulled out—frequently in spite of high positive pressure.

Pleural effusion is a very common complication of artificial pneumothorax. It has been stated that this occurs in all cases of pneumothorax if frequent enough observation of all cases were made. We do know that it occurs very often. We also know that as observations are made, many cases show no effusion during their pneumothorax. Some may show it only when the case is being abandoned. If the effusion remains clear, nothing is done with it unless it becomes so great that it obscures the vision. If left too long, masses of fibrin will

frequently form and interfere with the success of the collapse. There is danger too, that too great a collapse be created which will become adherent from the fibrin in the fluid and re-expansion of the lung become impossible. This is rather a serious thing should the effusion become purulent. Those cases which develop massive effusions in the presence of an unsatisfactory collapse should be re-expanded as soon as possible and be recommended for some other form of surgery. The expansion is imperative so that an empyema pocket not be formed. Frequently, persistent fluid may be absorbed after an adhesion which has been under tension has been cut. When the fluid becomes cloudy we have a transition to empyema.

This is too frequent a complication and perhaps the most important one. When a chest aspiration shows pus, refill with air is not indicated. The only cure of an empyema comes when the empyema pocket is obliterated. So few cases of tuberculous empyema have been cured by aspiration and irrigation that in some sanatoria empyema in a pleural space calls for immediate abandonment of the pneumothorax. The pus should be aspirated as it forms and the pneumothorax pocket obliterated as fast as possible. Some hold that thoracoplasty is immediately indicated in empyema cases. Ten to fifteen per cent of all pneumothorax cases develop empyema. If this pus continues to be present, the patient may seem to do well under aspiration for a long time. Sooner or later amyloidosis develops.

In discussing pneumothorax a logical question is, "When should a pneumothorax be abandoned?" More and more, there is a feeling developing that a pneumothorax should be kept until abandoned because of some complication. Certainly it should be abandoned when it is no more accomplishing the purpose for which it was instituted, namely: the control of the signs and symptoms of tuberculosis. In that case it should be abandoned for some other procedure. When it is abandoned because of some complication, the question is, "Should some other procedure follow?"

If no definite cavity was visualized before the lung was collapsed and the lung has been collapsed three to five years, we have a feeling that the lung should be healed. If a definite cavity of any size was present, the usual experience has been that the cavity will open again sooner or later in a vast majority of cases. Probably if it is necessary to abandon a pneumothorax under three years a thoracoplasty immediately would save a reactivation of the infection.

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Preliminary studies on the bodies of ten victims of high explosive detonations in recent air raids over England indicate that five died from the effects of the blast, three from lung injury and carbon monoxide poisoning, and two from compression asphyxia. In those dying from the effects of the explosion only, the lungs showed ruptured alveoli, vesicular and interstitial emphysema, capillary hemorrhage, venous congestion and edema. Geoffrey Hadfield, R. H. A. Swain, Joan M. Ross and Jean M. Drury-White, pathologists in the E.M.S., England, were surprised that the amount of lung damage demonstrated by necropsy was not greater.

Obstetrical Analgesia with Sigmodal

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AT the 1936 meeting of the American Medical Association in Kansas City we announced that we were experimenting with a new barbiturate which we employed for the purpose of alleviating labor pains. This drug, sigmodal, chemically sodium-amyl-beta-bromallyl-malonyl urea, has the following characteristics which make its use in obstetrics advantageous: rapid action, low toxicity, rapid elimination. A further advantage of the drug is the operator's ability to neutralize its action instantly by intravenous administration of metrazol or coramine, thus substantially widening its margin of safety. Sigmodal is administered rectally.

In October 1936 we published a preliminary report on our experiences covering 45 cases.¹ In December 1937 at the meeting of the Southern Medical Association we reported on our first 200 cases with sigmodal.² The present report deals with 350 additional cases under sigmodal sleep, and brings our reported total up to 550 cases. No attempt will be made to evaluate other methods of alleviating labor pains or to discuss the viewpoints of the different authors, pro and contra, on the use of analgesic agents in labor. The sole purpose of this presentation is to give an accurate objective account of our experiences with sigmodal in alleviating labor pains.

As stated before, sigmodal is a rapidly acting barbiturate; this property is due to an asymmetric C atom. The drug undergoes rapid decomposition in the organism, most likely in the liver, and its elimination is fast and complete. Years ago we tried to determine the rate of elimination through the kidneys and failed to find any trace of the drug two hours after delivery (four to six hours after administration). The concentration of the drug in the blood stream reaches its maximum between one and two hours after administration, a fact which has an important bearing on time of administration and the dosage used. It is probable that sigmodal, circulating in the maternal blood stream, passes through the placenta and has some effect on the fetus. However, its influence on the vital fetal centers is slight and vanishes with the decrease in the concentration of the drug in the maternal blood. This is apparently the reason for the spontaneous cry and respiration in the vast majority of our cases. It will be shown later that in ten cases of delayed cry and respiration sigmodal was administered less than two hours before delivery.

Sigmodal is marketed in a 10 per cent solution, stabilized by 10 per cent each of antipyrine, glycerin, and alcohol. The presence of antipyrine is considered objectionable in some quarters because of a possible danger of agranulocytosis. In our opinion, however, this fear seems to be unwarranted, as it is quite improbable that the amount of antipyrine (1 Gm.) which is contained

in the average dose of sigmodal (10 cc.) could produce a definite or lasting change in the blood picture. Our conviction is based on findings in numerous blood examinations in our series.

Sigmodal is administered rectally, is absorbed rapidly, and has no irritating effect upon the rectal mucosa. Neither hemorrhoids nor fistula in ano interferes with its administration. Rectal administration of drugs in the parturient seems to us preferable to the oral route because of the tendency of a certain group of patients to vomit during delivery. Successful alleviation of labor pains with sigmodal requires two indispensable prerequisites: (1) an empty bowel, and (2) establishment of true labor. As to the necessity of an empty bowel, it seems quite evident that large amounts of feces, occupying the lower rectum, would absorb part of the drug and prevent its absorption into the blood stream. It is therefore of paramount importance that a thorough cleansing enema be given at the onset of labor. The importance of establishment of true labor before administration of the drug cannot be overstressed. Too early administration could possibly delay contractions and necessitate unduly prolonged sigmodal sleep.

Our present series shows a considerable increase of instrumental deliveries in contrast to our previously reported series. This is not due to the action of sigmodal, as will be borne out later, but partly to the increased use of additional opiates and partly to the teaching in some quarters which recommends low forceps and episiotomy as standard termination even of normal deliveries. Another interesting feature in this series is the increased use of oxytocics: infundin, pitocin and pituitrin, in the first stage before administration of sigmodal. This kind of premedication has resulted in shortening of total delivery time. To induce sigmodal sleep we employ only the simplest of instruments: a 10 cc. Luer syringe and a thin urethral rubber catheter fitting tightly onto the tip of the former. In addition, a lubricant and a small amount of tap water are needed. The procedure is started as soon as the three cardinal conditions are fulfilled, namely, empty bowel, establishment of true labor, and sufficient dilatation of the cervix.

As stated in our previous publications, the ideal dilatation of the cervix is 2½ cm. in primiparae and 1 to 1½ cm. in multiparae, provided true labor is definitely established and contractions occur regularly and effectively. In administration of the drug, the patient is placed on her left side and the thin urethral rubber catheter, well lubricated, is inserted into the rectum as high as possible, preferably beyond the fetal head. The indicated amount of sigmodal is withdrawn from the container and slowly injected through the catheter, and is followed by 5 cc.

of tap water to assure complete administration. The catheter is withdrawn and pressure is exerted upon the anus for several minutes by means of a pad. The patient then is returned to a comfortable position. Due to the rapid absorption of sigmodal, its action becomes noticeable in fifteen minutes; the patient shows increasing signs of drowsiness and, as a rule, falls asleep after about thirty minutes. Reaction to labor pains generally consists in some moaning and groaning during the contractions and there might be some unruly movements at the moment of maximal intensity; the patient then resumes her peaceful sleep between contractions. Sigmodal sleep, while obliterating the patient's memory of the whole procedure of delivery, as a rule is not deep enough either to eliminate fully the response or co-operation of the patient, a fact which in our opinion is of great importance for the normal progress of labor and for efficient management of the delivery.

The intensity of the action of sigmodal increases slowly during the first two hours after administration, remains at its peak for about one hour and then decreases gradually. The effect of a single dose of 8 to 10 cc. lasts between four and six hours. However, in those cases where prolonged sigmodal sleep is needed, additional amounts may be given in doses of 4 to 5 cc., and patients may be kept under its influence for any desired length of time. In some instances sigmodal sleep has been extended over a period of more than twenty-four hours. We feel, however, that sigmodal sleep should not be induced less than two hours before the expected termination of delivery, because the maximal concentration of the drug in the blood stream at that time might cause sleepy babies and necessitate resuscitation. Sigmodal administered in proper dosage at the proper time has no untoward effect on the vital fetal centers as shown in the vast majority of our babies which were born with good color, spontaneous respiration, and lusty cry.

In previous publications we mentioned repeatedly that sigmodal, besides its numerous advantages, has one drawback, which, however, is common to all barbiturates: a certain amount of excitement occurs in some patients and, in a very few instances, marked restlessness. Abbott,³ who studied the action of barbiturates, stressed the fact that they are mid-brain sedatives; they act, according to Tritsch and Brown,⁴ as excitants in 25 per cent of all cases. The amount of restlessness due to sigmodal is very slight and negligible in comparison with that produced by other barbiturates. We have tried, as already mentioned in our last paper,² to eliminate restlessness entirely from sigmodal sleep by injecting 1/48 gr. of dilaudid about fifteen minutes before administration of sigmodal. This experiment has been continued on a large scale in our present series and resulted in success in the form of almost complete elimination of restlessness. Unfortunately opiates, being depressants on maternal and especially on fetal respiratory centers, have a distinct bearing on delayed cry and respiration in some cases. In other instances the drug has interfered with the intensity and regularity of contractions.

TABLE I.
Age and Parity

PRIMIPARAS						
Up to 19	20-24	25-29	30-34	35-39	40-45	Total
11	97	130	71	13	1	323
MULTIPARAS						
Up to 19	20-24	25-29	30-34	35-39	40-45	Total
	1	9	9	5	3	27

In a number of cases where contractions were unusually painful before dilatation of the cervix and progress of labor allowed induction of sigmodal sleep, we tried to alleviate the distress temporarily by oral administration of other barbiturates. Most frequently used were pentobarbital, in other cases seconal, and in some few instances allonal and sodium luminal. It shall be shown later that the combination of sigmodal with pentobarbital, due to the latter's very slow elimination, has a delaying effect on contractions and, in some cases, is responsible for delayed cry and respiration.

Our present series of 350 cases consists of 323 primiparae and 27 multiparae; ages range from 16 to 45 years (table I). In 223 patients we employed some premedication before sigmodal (table II).

In a number of cases sigmodal inadvertently or unavoidably was given at unorthodox stages of dilatation, ranging from 1½ cm. to almost complete dilatation in primiparae, and from 1 to 4 cm. in multiparae (table III).

The dosage of sigmodal we employed was from 8 to 10 cc., but in a number of cases additional quantities were given up to a total of 25 cc., keeping patients under sleep for more than twenty-four hours (table IV).

In a number of cases where the effect of sigmodal did not seem adequate, analgesia was intensified by additional medication (table V). It is our opinion that the benefits of increased analgesic effect from additional medication are out of proportion to the increased risk of delayed cry and respiration.

Delays in contractions during sigmodal sleep are carefully registered. A resumé is given in table VI.

In 38 cases or 50 per cent of the delayed contractions, additional medication of narcotics and analgesics had been given during sigmodal sleep (table VII).

During the final stages of labor, supplementary anesthesia was employed in 339 cases; 335 of them were terminated under inhalant anesthesia (table VIII).

Deliveries were spontaneous in 76 instances and instrumental in 266; one delivery was terminated by cesarean section because of a Naegeli pelvis. We encountered ten breeches (one a footling presentation), one brow presentation, and three sets of twins. Rotation was needed in twenty-four cases. Low forceps, with or without episiotomy, was used in 248 cases; two of them offered considerable difficulty. Mid-forceps deliveries were performed in sixteen instances and high forceps in

TABLE II.
Premedication

OXYTOCICS	None	Quinine	Infundin	Infundin	Infundin	Infundin	Pitocin	Pituitrin	Pituitrin
				Quinine	Castor Oil	Castor Oil			Quinine
						Quinine			Castor Oil
	127	1	73	6	2	3	4	1	1
NARCOTICS AND ANALGESICS	Hyoscine	Morphine	Dilaudid	Nembutal	Seconal	Seconal	Codeine	Codeine	Codeine
						N ₂ O ₂	Nembutal	Seconal	Aspirin
							Allonal	Nembutal	Seconal
	1	1	52	24	5	1	1	1	1
OXYTOCICS, NARCOTICS AND ANALGESICS	Infundin	Infundin	Infundin	Infundin	Infundin	Infundin	Infundin	Pituitrin	Pitocin
	Atropine	Dilaudid	Nembutal	Nembutal	Codeine	Nembutal	Dilaudid	Dilaudid	Nembutal
				Dilaudid	Seconal	Seconal	Seconal		Mg SO ₄
	1	18	12	2	2	2	1	1	1

TABLE III.
Dilatation of Cervix at Induction of Sigmodal Sleep

PRIMIPARA							MULTIPARA				
1½	2	2½	3	3½	4	Almost Complete	1½	2	2½	3	4
cm.	cm.	cm.	cm.	cm.	cm.		cm.	cm.	cm.	cm.	cm.
28	72	75	96	18	21	13	8	6	3	8	2

TABLE IV.
Dosage of Sigmodal

SINGLE DOSES			REPEATED DOSES				
Less than 6 cc.	Up to 8 cc.	Up to 10 cc.	6 plus 5 cc.	8 plus 4 cc.	10 plus 5 cc.	10 plus 10 cc.	10 plus 10 plus 5 cc.
11	92	143	13	31	47	10	3

Number of Repeated Doses

PRIMIPARA				MULTIPARA		
2 Doses	3 Doses	4 Doses	Total	2 Doses	3 Doses	4 Doses
93	7	2	102	2	0	0

TABLE V.
Narcotics and Analgesics After Sigmodal Administration

Morphine	Dilaudid	Hyoscine	Nembutal	Seconal	Dilaudid Hyoscine	Dilaudid Hyoscine Nembutal	Dilaudid Hyoscine Seconal	Dilaudid Codeine Veronal	Nembutal Codeine	Hyoscine Morphine Seconal Sod. Luminal	Hyoscine Seconal	Hyoscine Nembutal	Hyoscine Sod. Amytal
2	15	11	6	5	1	2	1	1	1	1	4	3	1

TABLE VI.
Contractions Delayed

Very Slightly	Slightly	Moderately	Definitely	Total	OXYTOCICS USED		
					Infundin	Pituitrin	Total
7	25	29	15	76	13	2	15

TABLE VII.
Additional Analgesic Medication Used in Delayed Contractions

None	Morphine	Dilaudid	Hyoscine	Nembutal	Seconal	Dilaudid	Dilaudid	Dilaudid	Dilaudid	Total
						Nembutal	Seconal	Nembutal	Nembutal	
							Codeine	Hyoscine	Seconal	
								Hyoscine		
38	1	18	3	10	2	1	1	1	1	76

TABLE VIII.
Supplementary Anesthesia for Terminating Deliveries

None	Ether	Gas (N ₂ O ₂)	Ether plus Gas	Ethylene	Chloroform	Hyoscine	Local Anesthesia (Novocain-Adrenalin)	Total
7	233	71	25	5	1	4	4	350

TABLE IX.
Type of Delivery

Spontaneous	Low Forceps and Epistomy	Mid-Forceps	High Forceps	Occiput-Posterior (Rotation) (included in low forceps group)	Breech Deliveries (1 Piper Forceps)	Cesarean Section	Twins	Total
76	246	16	1	24	10	1	3	350

TABLE X.
Condition of Mothers

Good	Postpartum Hemorrhages		Shock Due to Difficult Forceps Operation (Counted in previous group)	Severe Vomiting	Cyanosis	Restlessness	Patient Irrational	Total
		With Shock						
337	3	2	1	1	2	4	1	350
	5					5		

TABLE XI.
Delayed Cry and Respiration

Very Slightly Delayed (1 to 3 Minutes)	4 to 9 Minutes	10 to 15 Minutes	More Than 15 Minutes	Total
25	12	2	1	40

TABLE XII.
Resuscitation

STIMULANTS USED									
Spanking	Tracheal Catheter	CO ₂	Bath (Hot or Contrast)	Bath	Bath	Bath	Adrenalin (Counted in previous group)	Coramine (Counted in previous group)	Total
				CO ₂	CO ₂	CO ₂			
					Lobelin	Artificial Respiration			
5	8	1	11	8	4	3	1	1	40

TABLE XIII.
Delayed Cry and Respiration

TYPE OF DELIVERY				TOTAL	COMPLICATIONS			
Spontaneous	Low Forceps	Mid-Forceps plus Rotation	Breech		Cord Tight Around Neck	Very Difficult Forceps with Rotation	Twins	Piper Forceps
11	22	4	3	40	2	1	1	1

TABLE XIV.

PREMEDICATION BEFORE ADMINISTRATION OF SIGMODAL							ADDITIONAL MEDICATION AFTER ADMINISTRATION OF SIGMODAL				SUPPLEMENTARY ANESTHESIA BEFORE DELIVERY			
Narcotics				Barbiturates			Narcotics			Barbiturates	Ether	Gas	Ether plus Gas	Novocain
Dilaudid	Morphine	Codeine	Hyoscine	Nembutal	Seconal	Sod. Amytal	Dilaudid	Morphine	Hyoscine	Sod. Luminal				
13	1	1	1	6	2	1	2	1	4	1	29	6	4	1

one case. Piper forceps was used in one instance on the after-coming head (table IX).

The condition of the mothers was good in 337 instances, while complications of some kind arose in thirteen cases. All of the mothers recovered and there was no increase in morbidity over reported averages. In one case we experienced considerable drop of blood pressure, possibly due to an additional medication of 1½ gr. pentobarbital and of 10 cc. of 25 per cent magnesium sulfate solution. Other complications are summarized in table X.

Delayed cry and respiration occurred in forty of our babies. However, the delay was very slight (one to three minutes) in twenty-five instances. There was, in twelve cases, a delay in cry and respiration amounting to five to ten minutes and in two cases from ten to fifteen minutes; the cry of one baby was delayed more than fifteen minutes (table XI).

Resuscitation was successful in all of the above cases (tables XII and XIII).

We pointed out earlier that, in our opinion, the increased use of opiates and of additional barbiturates in this series had a definite bearing on the increase of delayed cry and respiration. Table XIV bears out this contention adequately. It shows that in our forty cases with delayed cry and respiration, narcotics had been administered in twenty-six instances, either as premedication or after induction of sigmodal sleep. Delayed cry and respiration occurred in 16 per cent of those cases which had received dilaudid and in 14 per cent of the cases with pentobarbital medication.

Considering the dose of sigmodal and the time of its administration before delivery in regard to our cases with delayed cry and respiration, the standard dose has been exceeded in five instances; sigmodal was given three times within one hour's time before actual delivery and ten times within one to two hours before delivery which means, the delivery took place when the concentration of the drug in the blood stream of mother and baby was at its peak (table XV).

We had in our present series three stillborn infants; all of them were macerated. One was due to syphilis, one to anemic infarct, and the third to severe nephritis of the mother. Of all the babies which were born alive,

we lost only two. One of them was a premature infant weighing 4 lb. and 14 oz.; cry and respiration were delayed for five minutes and death occurred four hours later. The mother was a primipara, 34 years old; total labor time amounted to 14 hours 59 minutes; the delivery took place 2 hours 5 minutes after administration of 8 cc. of sigmodal and was spontaneous under light supplementary ether anesthesia. No additional medication had been used. The other infant had a moderate delay of cry and respiration but remained cyanotic after resuscitation and died five hours later. The mother was a primipara, 23 years of age; the total labor time was 9 hours 22 minutes. This patient had received a premedication of dilaudid 1/48 gr. before administration of 10 cc. of sigmodal; she delivered 3 hours 36 minutes after its administration under supplementary ether anesthesia. The delivery was terminated by low forceps and episiotomy (table XVI). The fetal mortality in our present series of 350 cases, excluding the macerated babies, amounts to 0.57 per cent, or, applied to our reported total of 550 delivery cases under sigmodal sleep, is only 0.36 per cent. We believe that our fetal mortality compares very favorably with any other method used in alleviation of labor pains.

The average total labor in our primiparae was 12 hours and 4 minutes and in our multiparae 6 hours and 15 minutes. These figures give clear evidence that sigmodal has no delaying effect on labor but rather shortens it definitely. The average medication time (time from the administration of sigmodal to the termination of the delivery) amounted to 4 hours and 17 minutes in primiparae, and 2 hours and 40 minutes in multiparae. Of the primiparae, three have been kept under sigmodal sleep for an unusually long time, one 22 hours, another 24 hours, and a third, 26 hours, without any undue effect.

Analgesia in primiparae was complete in 77.4 per cent of the cases, fair in 15.8 per cent, and inadequate in 6.2 per cent. In three cases or 0.6 per cent, there was no analgesic effect at all. Analgesia in multiparae was complete in 63 per cent and fair in 33.3 per cent, while in one case or 3.7 per cent no analgesic effect could be obtained.

Amnesia in primiparae was complete in 80.2 per cent,

TABLE XV.
Delayed Cry and Respiration

ADMINISTRATION OF SIGMODAL						
Less Than Two Hours Before Delivery					Two Hours Before Delivery	
Single Doses			Repeated Doses			Repeated Doses
Amount	Time Before Delivery		Amount	Time of Last Administration Before Delivery	Minutes	Amount
	Hours	Minutes				
5 cc. (plus Nembutal 4½ gr.)	1	20	8 cc. + 4 cc.	0	27	10 cc. + 3 cc. + 3 cc.
8 cc.	1	45	10 cc. + 4 cc.	1	18	10 cc. + 3 cc. + 4 cc.
10 cc.	1	14	10 cc. + 5 cc.	0	46	10 cc. + 8 cc. + 4 cc.
10 cc.	1	15	10 cc. + 5 cc. + 3 cc.	0	50	
10 cc.	1	17				
10 cc.	1	41				
10 cc.	1	42				

TABLE XVI
Fetal Mortality

STILLBORN; Macerated		DIED AFTER DELIVERY										
Cause	No.	Premedication	Amount of Sigmodal	Medication Time		Total Labor Time		Supplementary Anesthesia	Type of Delivery	Term	Time of Death After Delivery	No.
				Hrs.	Min.	Hrs.	Min.					
Syphilis	1	None	8 cc.	2	5	14	59	Ether	Spontan.	Premature. Weight 4 lbs. 14 oz.	4 hours	1
Anemic Infarct of Placenta	1	Dilaudid 1/48 gr.	10 cc.	3	36	9	22	Ether	Low Forceps and Episiotomy	Full	5 hours	1
Nephritis of Mother	1											
	3											2

fair in 14.2 per cent and poor in 5.6 per cent. However, in one of these cases the interval between administration and delivery was too short to allow the drug to become effective. In multiparae amnesia was complete in 70.4 per cent, fair in 18.5 per cent and poor in 7.4 per cent, while one case was a complete failure.

SUMMARY

Experience with sigmodal in 350 obstetrical patients is presented, bringing our reported total up to 550 cases. The effect of the drug on mother and baby has been carefully studied and its safety proved. There was no maternal mortality in our 550 cases nor increased morbidity. Fetal mortality in our 550 cases (not figuring macerated fetuses or babies dead before admission to the hospital) was 0.36 per cent. Our losses consisted of two babies, one of which was premature. The combined use of sigmodal and additional opiates or barbiturates resulted in delayed cry and respiration in forty cases, fifteen of which necessitated resuscitation. The most frequently used opiate was dilaudid. Its combination with sigmodal reduced restlessness in our last 350 cases to five cases, or 1.4 per cent. Interference with intensity or regularity of contractions was observed in 76 cases, 15 of them requiring infundin or pituitrin. These latter patients had received additional doses of opiates or pentobarbital as supplementary medication.

The average total time of labor in primiparae was 12

hours and 4 minutes; in multiparae 6 hours and 15 minutes.

CONCLUSIONS

After four years of experience with sigmodal in alleviation of labor pains, in a total of 550 unselected cases, we feel that continued use is warranted.

The drug, administered in recommended dosage and not given less than two hours before the expected time of delivery, has no untoward effect on mother or baby. Total labor time is definitely shortened. The amnesic and analgesic effect of sigmodal is satisfactory. On the basis of repeated blood examinations we are emphatically of the opinion that the presence of antipyrine in sigmodal does not constitute a hazard and does not predispose to agranulocytosis.

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NOTE: The records of the cases here reviewed were made available by the following hospitals in St. Louis: St. Luke's, Jewish, Deaconess, De Paul, Christian and Booth Memorial, and by Grant Hospital in Chicago. We are indebted to Drs. Riordan, Ayars, and Ringo of St. Louis, who kindly allowed us the use of some of their records, and Dr. Ellen Loeffel, who carefully worked out the data for this paper.

Causes of Blindness in South Dakota*

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THE present program for needy blind in South Dakota started in February 1939 as a part of the Social Security Department. A fund was set up by the state matching Federal funds to give aid to the indigent blind between the ages of 18 and 65. Blind persons younger than 18 years are cared for by the state or local welfare agency, and indigents over 65 are automatically on the Old Age Pension. The Federal government limits the definition of blindness to those who have no better than 20/200 vision, with one exception—that anyone having 20/100 vision, if his visual field is subtended by an arc of 20° is classified as blind.

All cases to be classified as "blind" have been examined by specialists recognized by the South Dakota Eye and Ear Academy as ophthalmologists, and their reports have been checked and approved by myself as the consulting ophthalmologist. Of course, some of the cases who made application and who have been examined have been rejected because of too good vision to qualify as "industrially blind." However, most of those applying have been found to be very definitely within the limits prescribed above. Since the inception of the program in 1939, there have been 267 cases qualified as "blind." I have classified the data obtained from these cases and it is very interesting to compare it with the data from other states where such a study has been made. In this state there is a large Indian population in which there is a high percentage of blindness from trachoma. In fact, about one-third of our blindness is directly due to trachoma making our percentages vary a good deal from other states as regards etiology.

The following tables attempt to give a picture of the blind population of South Dakota, that is, the indigent blind population between the ages of 18 and 65.

I. *Distribution of Blind Cases by Counties.* No attempt was made to show the percentage of blindness in any one county because of the small number of cases involved. The main point to be noted about this table is that the largest number of cases in any one county are not in those which contain the larger cities of the state but in the counties which have the Indian Reservations and thus have the trachoma problem.

County	No. of Blind Cases	County	No. of Blind Cases
Aurora	4	Clark	1
Beadle	3	Clay	5
Bon Homme	4	Codington	3
Brookings	1	Corson	5
Brown	12	Custer	2
Brule	3	Davison	4
Buffalo	24	Day	5
Butte	2	Deuel	4
Campbell	2	Dewey	5
Charles Mix	9	Edmunds	3

County	No. of Blind Cases	County	No. of Blind Cases
Fall River	4	Meade	1
Faulk	1	Miner	1
Grant	2	Minnehaha	10
Gregory	1	Moody	7
Haakon	2	Pennington	7
Hamlin	2	Perkins	3
Hand	4	Potter	3
Harding	1	Roberts	11
Hughes	5	Sanborn	1
Hutchinson	1	Shannon	18
Hyde	1	Spink	7
Jerauld	1	Todd	6
Jones	1	Tripp	2
Lake	4	Turner	10
Lawrence	8	Walworth	3
Lincoln	1	Washabaugh	4
Lyman	5	Yankton	4
McCook	2	Ziebach	10
Marshall	7		

II. *Age.* Blindness is definitely an affliction of the older ages. Each ten year group is definitely larger than the preceding group.

Age	Number	Per Cent
18 to 29	27	10.1%
30 to 39	41	15.4
40 to 49	62	23.2
50 to 59	78	29.2
59 to 65	59	22.1

Approximately one-half the group are between 60 and 65. In many of the other states there is a large gap in the figures from 18 to 40, but not in this state, probably due to the number of Indians who lose their vision from trachoma in this age group.

III. *Sex.*

	Number	Per Cent	Pct. of General Population
Total	267	100.0%	
Males	159	59.5	53%
Females	108	40.5	47

The incidence of blindness is shown to be decidedly greater among men than among women, probably because of the more active industrial lives that they lead.

IV. *Race.*

	Number	Per Cent
Total	267	100.0%
White	158	59.1
Indian	109	40.9

STATE POPULATION (1935)

	Number	Blindness per 1,000 Population
White	675,850	.023 per 1,000
Indian	15,350	.71 per 1,000

In other words, the percentage of blindness is 35 times as great in the Indian population as it is in the white.

*Read before the meeting of the South Dakota State Medical Association, Watertown, May 20-22, 1940.

V. Degree of Blindness.

	Number	Per Cent
All Degrees	267	100.0%
Total Blindness	92	34.4
Light Perception Only	97	36.3
20/200 or less	71	26.7
Over 20/200	7	2.6

Only seven (or 2.6 per cent) had over 20/200 vision with the visual angle 20° or less. These were all glaucoma cases, whose prognosis of course is very poor indeed.

VI. Age at Onset.

	Number	Per Cent
Total	267	100.0%
Infancy	41	15.4
1 to 10	44	16.6
10 to 19	49	18.8
20 to 29	30	11.3
30 to 39	36	13.6
40 to 49	33	12.5
50 to 59	29	10.9
60 to 65	5	1.9

Blindness ordinarily occurs in the later years of life. In most states, the majority of the blindness is from 50 years onward. However, in South Dakota the high incidence of trachoma upsets this customary ratio, as many of the cases become blind in their early years from corneal complications.

VII. Etiology.

	Number	Per Cent
1. Infectious Diseases	122	45.7%
Trachoma	94	35.2
Syphilis (acquired 5, congenital 3)	8	
Gonorrhoea	6	
Measles	4	
Scarlet Fever	2	
Meningitis	2	
Smallpox	2	
Typhoid	1	
Influenza	1	
Tuberculosis	1	
Sinusitis	1	
2. Congenital and Hereditary	38	14.2
This includes:		
Glaucoma	15	5.6
Myopia	13	4.9
Congenital cataracts	6	
Malformations	4	
3. Traumatic	37	13.7
Puncture wounds	10	
Skull injuries	9	
Gunshot wounds	6	
Dynamite caps	5	
Lye burns	3	
Powder explosions	2	
Birth injury	1	
Struck by lightning	1	
4. Non-infectious Diseases	23	8.6
Old age (senile cataracts)	12	
Diabetes	5	
Brain tumor	3	
Nephritis and hypertension	2	
Epilepsy	1	
5. Toxic Poisoning (alcohol)	1	.38
6. Unknown	46	17.2

It has to be realized that certain factual information valuable to a complete study is not available. Many of the afflicted persons had been blind for many years before they were examined. Memory of the past disease, even if ever accurately determined, was inaccurate. Incomplete or misleading information was often given to the examining physician, not with intent to deceive, but because of a lack of understanding on the part of the patient.

VIII. Topographical.

	Number	Per Cent
Total	267	100.0%
Eyeball	62	23.2
Cornea	106	39.3
Iris and ciliary body	4	1.5
Lens (cataract)	30	11.2
Choroid and retina	30	11.2
Optic nerve	32	11.6
Vitreous	3	1.1

Blindness involving eyeball as a whole includes glaucoma, malignant myopia, congenital malformations, and phthisis from panophthalmitis and trauma.

Of the 62 cases involving the eyeball as a whole:

	Number	Per Cent
Phthisis	34	12.7%
Glaucoma	15	5.6
Myopia	13	4.9

Of the large group (106) involving the cornea, most of them were due to trachoma with resulting pannus and leucoma. A few were due to keratitis (congenital syphilis) and to ophthalmia neonatorum.

	Number	Per Cent
Trachoma	94	35.2%
Syphilis	6	2.3
Gonorrhoea	6	2.3

In this state, only a small percentage is caused by cataract (30 cases—11.2 per cent). This is a point of difference with other states that have published reports, where about one-third of the blindness is caused by cataract. In checking the records to find cases suitable for restorative treatment, only 14 of these cataracts were operable. Chorio-retinitis and optic atrophy are the causes of blindness in practically all of the cases where etiology was "undetermined." It is probable that most of them are due either to syphilis or to old glaucoma. In the cases of vitreous hemorrhage, two followed trauma from dynamite cap explosions and one from being poked in the eye with a revolver barrel. In this study, there were five cases of sympathetic ophthalmia of the other eye, all following puncture wounds of the eye.

CONCLUSIONS

1. Practically all this group are hopelessly blind, except for a few cataract cases.
2. What can we do to aid in preventing blindness in the next generation?
 - (a) Discourage child-bearing in the congenitally blind.

- (b) Continued use of "Crede" method for ophthalmia neonatorum.
- (c) Encourage Wassermann tests on expectant mothers. Be on the lookout for syphilis and help to keep this spirit alive in the profession at large.
- (d) Encourage immunization against scarlet fever, measles, smallpox, and typhoid.
- (e) Keep alive "safety propaganda" to prevent traumatic injury:
 1. Keep sharp instruments from children.
 2. Shatter-proof lenses in glasses.
 3. Sympathetic Ophthalmia—(do not be too sympathetic with injured eye).
- (f) Help to keep patients with non-infectious systemic disease under care of their general physician.
- (g) Glaucoma. We must keep everlastingly at it to educate the general profession as to the signs and symptoms of glaucoma; not be too lazy to take tensions with a tonometer; not be too timid to operate early in the disease.
- (h) Trachoma: Keep in mind to evert the lids, and use a loupe. Trachoma causes blindness and trachoma can be cured. One should not ignore it, but should always keep it in mind in conjunctivitis and corneal ulcer cases in South Dakota.

Gold Therapy in the Treatment of Arthritis*

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THE use of gold as a therapeutic agent is recorded in the work of Mollgaard¹ in 1924 who made experimental observations on its use in the treatment of tuberculosis. The favorable results obtained by Mollgaard¹ encouraged attempts to utilize gold in the treatment of other chronic infectious processes on an empirical basis. The treatment of arthritis with gold salts was introduced in Europe in 1927 by Forestier² who reported his review of arthritis in 1936. The popularity of this form of treatment has increased and a large enough series of cases has now appeared in the American literature to permit a fairly accurate appraisal of its merits. Hench et al³ have given an excellent discussion and review of the American and English literature.

Various gold compounds have been employed and are given by either intravenous or the intramuscular route. Among the chief preparations used are: Crisalbine (gold sodium thiosulphate), Aurocein (sulphydryl gold naphthyl trisulpho-carbonium), Myocrysin (auro-thio-malate of sodium), Allochrysin (auro-thio-propanol sulphionate of sodium), Solganal B (gold thioglucose).

Our experience has been confined principally to the use of gold sodium thiosulphate, which is supplied commercially in a stable solution in 50 mg. vials. This preparation is a solution of the white crystalline salt containing about 37 per cent of gold and has a chemical formula of $\text{Na}_3\text{Au}(\text{S}_2\text{O}_3)_2 \cdot 2\text{H}_2\text{O}$. This product is regarded as less toxic by such writers as Snyder,⁴ Traeger and Kelly and was the salt used in the original work of Mollgaard¹ in 1924.

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The action of the gold salts is not fully understood, its use falling in somewhat the same empirical category as arspenamine and tryparsemidate. The opinion seems to indicate that there is no direct effect upon the causative agent but rather an increased immunity of the joint structures enabling them to resist the inflammatory process. Other theories advanced are the possible benefit obtained through the mechanism of "shock therapy" as emphasized by Snyder, Traeger, and Kelly⁴ who have noted instances where slight overdosage of gold salts produced febrile reactions with leukocytosis similar to foreign protein reactions. The work of Hartfall,⁵ Garland and Goldie reveals that in animals approximately 80 per cent of the gold is excreted in the first twenty-four hours and the remaining 20 per cent is deposited in the tissues. In rare cases, toxic reactions occur with early minimal doses, but usually the reactions result after an accumulation of gold in the tissues up to a certain level.

The frequency and the severity of the toxic reactions of the gold salts has been responsible in large measure for their somewhat restricted use by the medical profession. Dosages have not been definitely standardized and various authors are employing widely varying quantities of the drug. Hartfall,⁵ Garland and Goldie in their report covering 900 cases of arthritis (750 of the atrophic type) used the following dosage schedule: first dose 25 mg.; second dose 50 mg.; and third and subsequent doses 100 mg., until a total dose of one gram had been given. A three or four months interval between courses was advocated inasmuch as delayed re-

actions may not manifest themselves until six weeks after the course of treatment is concluded. In cases where toxic reactions occurred, they recommended waiting two months after toxic symptoms disappeared, before resuming treatment.

Toxic effects on the blood are rare but are to be watched for closely; they are usually severe in nature. Among reported toxic effects are fatal agranulocytosis, purpura hemorrhagica, aplastic anemia, and spontaneous hemorrhages from lungs, uterus, and bowels. Jaundice as a result of liver damage has been reported in the series of Hartfall,⁵ Garland and Goldie, who list seven deaths as a result of known gold toxicity. Causes of death in their series were as follows: one from agranulocytosis, two from hepatic necrosis, three from purpura, and one from exfoliative dermatitis.

Wintrobe,⁶ Stowell and Roll have reported a case of aplastic anemia following gold injections. This patient had received a total of 230 mg. of gold sodium thiosulphate for the treatment of lupus erythematosus over a period of about eight weeks. The first sign of toxicity in this case was nausea and vomiting, followed in about one week with a slight dermatitis and marked pruritus on the flexor surfaces of the arms. This patient subsequently developed an aplastic anemia which was treated with iron, pentnucleotide, and blood transfusions. She was alive four years after the development of the anemia, although the blood picture had not entirely returned to normal. It was emphasized in this study that the evidence pointing toward gold therapy as the cause of the aplastic anemia was entirely circumstantial.

We began to use gold preparations in the treatment of arthritis in 1935. First we used it only in the infective atrophic type. Later we tried it on some of the hypertrophic types, especially during acute flare-ups in their affected joints, when their sedimentation rates were somewhat elevated. We also used it in the mixed types, especially where the sedimentation rate was increased. In a few patients who had poor veins Aurocein was given intramuscularly. This product, according to the manufacturer, is a sterile 5 per cent solution of a sulfhydryl-gold-naphthyl-trisulpho-carbonium derivative. It comes in 2 cc. ampules for intramuscular use. Oren⁷ gives a brief report of its action. We gave one ampule (2 cc.) twice a week for ten to twelve weeks, unless evidence of toxicity occurred, when the drug was either stopped or the dose reduced. Two patients showed symptoms suggesting allergy to the drug.

Gold sodium thiosulphate was given intravenously beginning with 10 to 15 milligrams and increasing rapidly to 50 milligrams, twice a week until 1,000 milligrams (1 Gm.) had been given, if no allergy or toxic manifestations occurred. Most of the patients received one full gram and many received two courses of injections with a rest period of at least three months between. All the patients were advised to return at intervals of one to three months, to have their sedimentation rates checked, and *immediately* if any symptoms of a recurrence or flare-up in their arthritis seemed evident—when further injections of gold sodium thiosulphate were

given. Sometimes it was not necessary to give an entire 1,000 milligrams to arrest the flare-up.

The past two or three years we have advised two courses of gold in all cases of the atrophic type, which has reduced the number of recurrences. Uric acid determinations were done in most of the cases, results varying from 3.1 mg. to 4.2 mg. per 100 cc. of blood. No cases suspicious of gouty diathesis were included in this series.

OTHER TREATMENT

Secondary anemia was combated by transfusions, high iron, vitamin diet and the usual drugs. Thirty-seven patients received varying doses of concentrated vitamin D, according to Reed,⁸ usually during a resting period between courses of gold injections. In general, it did not seem to have any added beneficial effect except in three patients, where it seemed to show rather striking improvement each time they took it. Comparing the other patients with those receiving gold sodium thiosulphate alone, no added benefit or more rapid improvement was noted.

In sixteen patients, colloidal sulphur was used with no definite benefit observed. This drug was also used chiefly between regular courses of gold. Some men, chiefly Yanagisawa⁹ and Kawai, have felt that the beneficial effect of gold was due to its sulphur content. Snyder¹⁰ et al have shown that 50 milligrams of gold sodium thiosulphate contains only 12.5 milligrams of sulphur. In view of the much larger doses of colloidal sulphur given our patients without definite benefit, along with similar experiences of other investigators in much larger series of cases, we doubt if it plays any role in gold therapy. The main diet prescribed in our cases was a general one, high in vitamins—with the caloric value varying with the weight of the patient. In a few instances of the atrophic type, where there were extensive effusions in the joints, a low caloric diet (a la Pemberton¹¹) was tried with apparent benefit in reducing the effusion in several cases.

All patients were urged to be up and around some every day, or to exercise all their joints if in bed, but to avoid fatigue. If pain persisted longer than an hour after putting joint at rest, exercise was reduced. Most of the patients were ambulatory, coming to the office for their gold injections.

Of the 141 cases included in this report, 104 were females and 37 males. Their ages varied according to table I.

It is noted that most of the cases of the atrophic type fell between the ages of 30 and 60. In studying the age of onset of the disease, it was evident that it occurred usually before 45, in contrast to the hypertrophic type, where onset most often occurred after the age of 50.

Naturally, the response of arthritis to the gold therapy is the most important matter to study and discuss. I have summarized my results in table II, separating the cases into six groups according to the duration of the

TABLE I.
Age Distribution

Type	Atrophic	Hyper-trophic	Mixed Types
Years			
0 to 10	1	0	
10 to 20	2	0	
20 to 30	4	0	
30 to 40	18	0	
40 to 50	14	6	4
50 to 60	30	10	8
60 to 70	4	14	7
70 to 80	1	16	1
80		1	
	74	47	20

The trend continues in the moderate improvement group. It is evident from this study that most improvement occurred in the group of atrophic cases, with the mixed type coming next and the hypertrophic showing the poorest response.

All cases included in this report were observed from one to five years. In no case did the arthritis get worse during the course or as an immediate result of the treatment. Fifteen and four-tenths per cent of the atrophic patients showed a recurrence of symptoms after only one course of gold, which usually occurred six to eighteen months after conclusion of the first course. If disease remained arrested for two years or longer, no recurrence occurred in my patients.

TABLE II.
Relation of Improvement to Duration of Disease

Duration	Type	Number of Cases	Arrested or Very Marked	Marked	Moderate	Slight	None
Less than 1 year	A	8	5	1	1	1	
	H	6	3	1	1		1
	M	4	1		1	1	1
1 to 2 years	A	7	1	3	2	1	
	H	5		1	3	1	
	M	2		1		1	
2 to 3 years	A	9	5	3			
	H	8	3	3	2	1	
	M	5	1	1	3		
3 to 5 years	A	11	6	1	2	2	
	H	3		1	2		
	M	2		1		1	
5 to 10 years	A	20	10	4	4	1	1
	H	12		2	6	4	
	M	3			2	1	
Many or 10 to 25 years	A	19	7	7	2	2	1
	H	12	3	3	2	2	2
	M	3		1	1	1	
		139	45	34	34	20	6

disease. I have also divided the cases according to their grade of improvement, as follows:

Arrested or very marked: Disappearance of all subjective symptoms, especially pain; free painless movement of all affected joints (except those previously ankylosed); disappearance of some swelling; gain in weight, appetite and general well being; return to normal life and moderate amount of activity, and normal sedimentation rate.

Marked improvement: 75 to 90 per cent reduction in pain; 75 to 90 per cent improvement in movement; no pain at rest; normal sedimentation rate; increased activity; definite improvement in general health.

Moderate improvement: 50 per cent reduction in pain and improvement in joint movement; little or no pain at rest; some improvement in general health; marked reduction in sedimentation rate.

Slight improvement: some reduction in pain and improvement in joint movement; less pain at rest; reduced sedimentation rate.

Analysis of table II shows that of the 45 so-called arrested cases, 34 (45.9 per cent) were of the atrophic type. Of the 34 cases showing marked improvement, 19 (55.8 per cent) were of the atrophic or mixed type.

Table III gives a comparison of my results with those of other men reported in the literature. A study of this chart based on about 1600 cases, definitely shows that gold therapy is of distinct value in the treatment of the chronic atrophic type of arthritis.

Some men have indicated in their reports that cases of duration of less than two years responded better to gold therapy. In our patients this was not altogether true. As indicated in table II many of the cases of longer duration showed marked improvement. It seems to me that the improvement varied with the amount of damage done to the joints by the disease, as well as the duration of the disease. This table also shows that older patients (45 to 60 years) responded almost as well as the younger group (30 to 45 years) of the atrophic type. This coincides with the experience of Snyder,¹⁰ Traeger and Kelly. All three cases in my series under 20 years became completely arrested and have remained so thus far (1 to 3 years).

We could see no relationship between the number of joints involved and their response to gold, except when the spine was involved or marked ankylosis existed. The length of time patients remained well without recurrences varied considerably. It seemed to be definitely

TABLE III.
(a la Sashin)

Authors	Number of Cases	Marked Improvement (per cent)	Not Improved (per cent)	Observation Period (years)	Relapse after 1 Course (per cent)	Deaths
Forestier	550	64.0	8.0	2 to 7		1
Hartfall, Garland & Goldie	690	66.7	14.1	1 to 5	13.2	7
Copeman & Tegner	51	58.0	6.0			
Crosby	27	33.3	14.8			
Parr & Shipton	70	57.0	20.0		2.3	1
Pemberton	69	56.5	11.5			
Sashin, Spanbock & Kling	80	43.7	17.5	1 to 5	10.4	
	1537	54.1 average	13.1 average			9 (0.58%)
Logefeil & Hoffman	74	65.0	14.7	1 to 5	15.4	0

TABLE IV.
Improvement vs. Time vs. Drop in Sedimentation Rate

Type	Atrophic	Hypertrophic	Mixed
(1 G. Gold S.T.)			
Average length of improvement	2.4 years	1.4 years	1.7 years
Average drop in sedimentation rate	48 mm. per hour	10 mm.	51.4 mm. (?)
Average rise in sedimentation rate	1 case 12-71 R. N. 2 cases 64-132 M. S.	0	0
Number of relapses	10 (50) Most of these responded to a second or third course of gold	5 (35)	4 (16)

related to a number of factors including the general condition of the patient, whether he or she resumed work or not, intercurrent infections, any added stress and strain of life, chronic fatigue, chilling of the body, etc.

The average length of improvement for all types is shown in table IV, along with the number of relapses. Most of the latter responded to a second or third course of gold.

There were 14 cases in our series involving the spine, all falling in the atrophic or mixed type. Improvement in these cases was as follows: *arrested*, 2; *marked*, 2; *moderate*, 5; *slight*, 4; *none*, 4.

It is generally accepted that the sedimentation rate of the erythrocytes is a fairly accurate index of the activity of the arthritis, especially the atrophic and mixed types. As a rule the hypertrophic types run low sedimentation rates, except during an acute flare-up in an affected joint. In our experience, the change in sedimentation rate corresponded quite closely to the clinical course of the disease, i. e., it went down as the patient's condition improved, and rose again during a relapse. In fact, its change seemed to precede the clinical change. This was particularly true in the atrophic and mixed types. In most cases it proved to be an excellent barometer of the response of the patient to treatment, and usually was a good warning of an impending or beginning relapse.

The Westergreen method of sedimentation rate was used. The rate of sedimentation of the red blood cells

TABLE V.
Sedimentation of Erythrocytes

Before Treatment		After Treatment	
Millimeters	No. Cases	Millimeters	No. Cases
0- 10	28	0- 10	105
11- 20	34	11- 20	17
21- 30	15	21- 30	7
31- 40	14	31- 40	2
41- 50	8	41- 50	1
51- 60	7	51- 60	1
61- 70	5	61- 70	1
71- 80	6	71- 80	1
81- 90	3	81- 90	1
91-100	8	91-100	1
101-110	1	101-110	1
111-120	5	111-120	1
121-130	0	121-130	0
131-140	1	131-140	1

at the end of sixty minutes is expressed in millimeters. The latest Todd & Sanford Clinical Laboratory text book gives the normal reading for men as 0 to 15 mm. in sixty minutes; the normal for women as 0 to 20 mm. in sixty minutes. In most cases, the sedimentation rate gradually went down during the course of treatment, but in many cases the greatest drop came during the first three or four weeks following completion of a course of gold injections. This again followed the clinical course quite closely. A study of table V bears out the above impressions. The average drop in sedimentation rate for the atrophic cases was 48 mm. per hour, the hypertrophic 10 mm. and the mixed types 51.4 mm. This latter high figure seemed to be due to five cases

TABLE VI.
Toxic Reactions

Nature	Kidney	Skin Rash	Fever	G. I. Symptoms	Jaundice
Severity	(2 cases) Grade 1—2 cases	(14 cases) Grade 1—10 cases Grade 2— 2 cases Grade 3— 1 case Grade 4— 1 case	(3 cases) Grade 1—1 case Grade 2—1 case Grade 3—1 case	(1 case) Grade 2-2	None
Length	One week each	10 cases—1 week 3 cases—4 weeks 1 case—8 weeks	2 cases—1 week 1 case—3 weeks	1 case—2 weeks	
Amount of Gold Given	1.0 gram 0.1 gram	Least—1 gram Most—1.5 gram Average—.7 gram		0.7 gram	
Effect on Arthritis: Grade of Improvement	4 cases	10 cases—Grade 4 2 cases—Grade 2 2 cases—none	Favorable	Favorable	
Unfavorable Sequelae	None	None	None	None	None

with sedimentation rates well over 100, which fell in this group. They all responded well to gold therapy with large drops in the sedimentation rates.

Toxic reactions occurred in 18 cases. The essential points about them are listed in table VI.

Of these, fourteen were skin reactions in the nature of a dry, scaly, itching, eczematous type of dermatitis, usually beginning on the extremities and spreading to the body and face. All but four were mild and disappeared in seven to fourteen days after the gold was discontinued. We found daily injections of plain sodium thiosulphate intravenously very helpful in controlling the spread and severity of the rash as well as the systemic toxic manifestations. Hypertonic baths, sedative and tar ointments took care of the itching and other local symptoms. Copeman mentioned calcium gluconate and injections of liver extract as valuable in combating toxicity, the latter especially if the liver seems to be affected. In four patients especially, all the toxic symptoms, local and systemic, were quite severe. They ran fevers from three to eight weeks ranging from 101° to 105°. The most ill patient had to be hospitalized for four weeks—ending up with a complete exfoliative type of dermatitis. Her arthritis cleared up beautifully and she has been free from all symptoms for over two years, and feeling better than she had for years. In fact, the striking thing in my series was that all those who got toxic manifestations received the best and most permanent therapeutic results from the standpoint of their arthritis. The two patients showing albumin and the two gastrointestinal toxic symptoms, nausea and anorexia, had very slight symptoms which disappeared quickly on discontinuance of the gold. Some toxic liver cases with jaundice have been reported in the literature but we have had none. None of our series had any permanent toxic manifestations. Some others have reported toxic reactions following the administration of as little as 30 mg. of the drug. Most of our toxic patients showed symptoms as they approached or passed the 500 mg. mark, although a few showed slight toxic symptoms very early in the course. Our experience would indicate that if one is ever on the lookout for the first sign of toxicity, questioning the patient carefully *before giving*

each injection, for symptoms of anorexia, nausea, chills, fever, polyuria, dryness of the skin, pruritis or urticaria, stopping the drug on any suspicions, and giving sodium thiosulphate daily until all toxic symptoms have disappeared, one need not particularly fear toxic reactions. Allergy to the drug must also be kept in mind, so we must start with very small doses.

The following have been listed in the literature as contraindications, i. e., severe renal or hepatic disease, asthma, urticaria, diabetes, pregnancy, granulopenia, purpura, thrombopenia, and primary and severe secondary anemia. We gave gold to one patient with mild nephritis and albuminuria without any demonstrable bad effect on the kidneys.

I wish to briefly call your attention to table VII, which lists other possible complicating factors in our cases. Some of these were corrected as indicated, but on the whole the arthritis was little benefited, if at all. In some cases, the arthritic symptoms definitely increased.

SUMMARY AND CONCLUSIONS

We attempted to analyze the effects of gold therapy in 141 cases of arthritis which we classified as follows: chronic atrophic type 74; chronic hypertrophic type 47; and mixed type 20. Gold in the form of gold sodium thiosulphate or Aurocein was given in recognized therapeutic doses in all cases but a few who received Solganol B (aurothioglucose). Our observations warrant certain conclusions which are as follows:

1. Gold therapy in the form of gold sodium thiosulphate intravenously (or Aurocein intramuscularly) seems to be of definite value in the treatment of the chronic atrophic (rheumatoid) infectious type of arthritis, giving 65 per cent arrested or marked improvement in 74 cases. In the mixed type of arthritis it seems to be of distinct value when the infectious phase is definitely active with high sedimentation rates. In 19 cases, 63 per cent of patients showed a moderate or better improvement. In the hypertrophic type of arthritis with normal sedimentation rates, gold therapy is of doubtful value. However, in those cases showing an acute flare-up in one or more joints with increased sedimentation rates,

TABLE VII

	Endocervicitis	Varicose Veins	Salpingitis	Tonsils
Number of Cases	9	5	3	28
Treatment	Cautery	Injection	Surgery	Removed
Effect on Arthritis	9 questionable	2 benefited 3 questionable	1 improved 2 worse	8 benefited 20 questionable

	Path. Gall-bladder	Obesity	Bronchiectasis	Heart
Number of Cases	6	2	1	1
Treatment	1 removed	Reduction	Lipiodol	Medical
Effect on Arthritis	Benefited	Both improved	0	0

	B. Tularensis	Goiter	Pneumonia	Menopause
Number of Cases	1	2	3	1
Treatment	Sulfanilamide	Plus 17 Plus 40	Usual treatment	Estrogen injections
Effect on Arthritis	0	Medicine 0	All worse	0

	Trauma	Pyelitis	Sinus
Number of Cases	2	2	1
Treatment	Physiotherapy	Sulfanilamide	
Effect on Arthritis	Some benefit	0	

it seems to have some value in improving the clinical picture of the arthritis and reducing the sedimentation rate. As these flare-ups, in our experience, are usually of comparatively short duration, the value of the gold therapy is naturally questionable.

The criteria for improvement are given.

2. An analysis of the age distribution of our cases is given, which would indicate that the onset of atrophic types is usually before 45 in contrast to the hypertrophic type when onset is most often after 50.

3. Our results compare favorably to other series reported in the literature. In a series of 1600 cases of chronic atrophic arthritis, 56 per cent show cures or marked improvement from gold therapy.

4. Recurrences occur in 15.4 per cent in our series, usually six to eighteen months after conclusion of first course. Our most recent experiences would indicate that this can be greatly remedied by giving atrophic types at least two courses of gold injections with an interval of three to six months between them.

5. Our experiences indicate that the duration of the disease alone, as well as the age of the patient, are not important factors affecting the response to gold therapy.

6. No definite relationship seems to exist between the number of joints involved and their response to gold, except when the spine was involved or marked ankylosis existed.

7. The sedimentation rate of the erythrocytes proves to be a fairly accurate index of the activity of the ar-

thritis, and is a valuable diagnostic as well as prognostic aid.

8. Toxic reactions occur in about 12 per cent of the cases. They are described in detail in a separate chart. None proved to be fatal and only two severe, lasting longer than one week. There were no permanent sequelae. Toxic reactions need not be feared if they are anticipated and promptly treated, and contraindications to gold therapy are kept in mind.

9. Other possible complicating factors in our cases are outlined and discussed.

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Coincident Ectopic Pregnancy and Acute Appendicitis

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COINCIDENT ectopic pregnancy and acute perforated appendicitis is very rare. Only three such cases were found in the literature.

This patient was a white woman 26 years of age. She had always been well, except for occasional headaches associated with nausea and vomiting. There was no history of pelvic disease, or of previous pregnancies, and menstruation had been entirely normal except for some spotting between the last two periods.

The present illness began with nausea, vomiting, diarrhea, and discomfort throughout the abdomen. When seen the next morning, ears, nose, throat, and chest were found to be normal. There was tenderness to palpation over the entire abdomen, but there was no muscle rigidity or rebound tenderness. Vaginal examination showed the uterus to be slightly enlarged. Pressure in the right adnexal region caused some discomfort. There was no palpable mass in either adnexal region.

The patient continued to vomit during the day, and was taken to the hospital in the evening. The leucocyte count was 17,050, and the physical findings were the same as on previous examination.

There was no nausea or vomiting the following morning. The abdominal discomfort was less, and there was still no muscle rigidity or rebound tenderness. The pulse was 88; the temperature, 99 degrees; and the leucocyte count was 11,350. There were no complaints during the day. The temperature was 98.2 degrees at noon and at 4:00 o'clock, 98.6 degrees. The patient ate her meals without vomiting, and there was no diarrhea. At 8:00 o'clock in the evening, she began complaining of pain in the right lower quadrant of the abdomen. She was having severe abdominal pain when seen a short time later. Examination showed a rigid abdomen, and a diagnosis of acute appendicitis and possible tubal pregnancy was made.

The patient was taken to the operating room, and the abdomen was opened through a subumbilical incision. Some slightly cloudy fluid was present in the abdominal cavity. There was a tense bluish mass in the right Fallopian tube about 1 centimeter from the uterus. The right Fallopian tube was removed. The appendix was found low down in the pelvis, adherent to the lateral wall and completely covered by the terminal ileum. There were no adhesions between the Fallopian tube and the appendix. The distal half of the appendix was gangrenous, and there was a perforation near the tip. The appendix was removed. Two soft rubber drains with gauze wicks and three iodoform gauze drains were placed down the lateral wall of the pelvis into the cul-de-sac through a stab wound in the right flank. The subumbilical incision was closed in layers without drainage. The patient had a rather stormy recovery, but left the hospital in good condition on the twenty-second post-operative day.

Upon opening the mass in the Fallopian tube, a blood clot was found. The pathological report by Dr. Floyd Grave states: The right Fallopian tube is about $3\frac{1}{2}$ inches long. Fimbriae present. The surface is very irregular. There is a large perforation near the uterine end. A large hard clot came from this area. (Sections were taken from this area.) The appendix is $3\frac{1}{4}$ inches long, and $\frac{1}{4}$ inch thick. The surface is discolored. There is a large perforation in the terminal third. The tip is gangrenous. A section from the Fallopian tube where the blood clot was removed shows a large collection of decidual cells. There is some other formless material and some infiltration with pus cells. Diagnosis: Ectopic pregnancy. Gangrene and perforation of the appendix.

The Use of Metals in Fractures

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THE use of metal in fractures has been a subject of controversy for the past two centuries. It is interesting to note that 200 years ago there was a great quarrel over the use of wire in the soft tissues in holding fractures together, and it was even suggested that he who used the wire should be barred from practicing medicine. From that time there has been great progress in the use of metals so that now the use of metal has been completely accepted. The criticism has largely been dissipated by the technic used and by the type of metals involved. In recent years, a great deal of study has been done on the effect of metals on the bone and also its action on the eventual healing of fractures. In earlier days it was thought that the rare metals had special influence, and gold and silver were the chiefly accepted forms.

In our study it was found that certain metals have different effects; that the use of zinc and copper are stimulating to bone production and that rarefaction occurs around steel plates and screws with definite necrosis of bone. It was noticed especially with some of the older forms in which the metals came loose and extruded from the wounds. The first metals were applied in the soft tissues usually in the form of wire and tended to immobilize the soft parts more than the osseous structures. Later, the surgeon became bolder and wires were used to fix the bone and were either drilled through or wrapped about them.

At the present time, there is much interest in the electrolysis of metal. Venable and Stucke have shown definitely that electrolysis occurs in metal plates buried in the tissue and that this electrolysis leads to a change which disturbs bone growth, and also the development of fluid which may be especially subject to infections. They sought an alloy which would be passive when in contact with body fluids and they devised a special alloy called vitalium of cobalt-chromium and molybdenum. This metal can be left in the tissue indefinitely and does not have to be removed as it is completely inert. Metal plates of stainless steel or of chromium often set up a reaction and usually these are removed as soon as there is indication of bone healing as shown by the X-ray and clinical study. In the neck of the femur these are usually left in for from six months to two years. Very rarely does one get healing in six months sufficient to permit the removal of the fixation and permit weight bearing. Plates and pins are usually removed in from eight to twelve weeks; wire, pins and screws are usually removed as soon as there is sufficient evidence of healing that a fixation is no longer needed.

With the introduction by Lane in 1905 of plates and screws devised by him, these came into great vogue, and by 1910 large numbers of fractures were plated by his method. However, many of these became infected either

primarily through the operative site or secondarily through the exudation which formed around the plate and screws with the degeneration and necrosis of the bone and soft tissues, necessitating quite a few amputations and also causing quite a few deaths. Immediately, there was growth of censorship, and open methods of treating fractures fell into disrepute again.

About this time, Steinmann was using his pins and screws in traction, and skeletal traction was used much more often than the open reduction of the fractures themselves. However, with the use of skeletal traction, it was found that there was too high a percentage of bone infection through the skin incision. In 1912, Sherman reported his series of cases of plating and improvements in reduction and fixation of fractures should be largely credited to the advances which he made, so that Sherman plates and screws have been standardized and can be obtained in fixed sizes and threads.

In 1914, Parham brought out his band, and as a result of Martin's work, this has since been called the Parham-Martin band. In the 1920's and 1930's, began the appearance of pins and nails for the fixation of hips. About that time, also, the flanged nail of Lange, later improved and slightly modified by Smith-Peterson, Henderson, Barkley, and Johansson, was introduced. The essential appearance of the nail, however, has not been much modified except that a collar has been attached and a hole drilled through the center for direct application of the nail rather than the blind or indirect method. Smith-Peterson possibly received the greatest amount of credit for utilizing the nail, and the operation is often called the Smith-Peterson operation for the fixation of intracapsular fractures of the femur. With the appearance of the flanged nails came Genslen's multiple pinning using as many as eight or nine Kirschner wires drilled through the shaft into the head through the fractured neck. At that time Moore presented his three standard pins as devised by himself. In regard to methods used it is known that the open reduction and fixation of fractured femoral necks have reduced the number of non-unions 50 per cent and that they have largely removed the dread of older people for this type of surgery.

Since the treatment of fractures is by manipulation, traction, and open reduction, it is important to select the manner of treatment which appears best indicated for the individual fracture. No set procedure should be exhibited for all fractures. It is not any more feasible that all fractures should be treated by manipulation than that all fractures should be treated by the open method. Cases being properly selected, the best results may be obtained. It is desired in the treatment of fractures that an anatomical reduction be obtained if possible, and certainly in this day and age when patients are insisting on

seeing the X-rays, anatomical reductions are much to be preferred. It is rather difficult at times to explain to the patient or to the patient's relatives why the bone ends do not match. It is even at times difficult to explain why a fracture line is visible inasmuch as one assumes by proper treatment that the fracture should no longer appear, and if the patient is not reasonable, or if the patient is looking for trouble, there is always danger of a law-suit even though there is no functional disturbance or any disability.

Surely, then, by open reduction in properly selected cases, the best method of treating fractures is determined; not only can one show, but one has testimony to the fact that the fracture has been reduced and healed. One not only improves the morale of the patient, but shortens his period of disability. By anatomical restoration one hastens the healing and the patient is back at work that much sooner. Open reductions are being freely permitted by insurance companies and workmen's compensation departments, where the indication can be shown. The problem is to attain the best possible results in the least possible time.

The selection of fractures for the open method of treatment includes those of the patella, olecranon, both bones of the forearm and leg, the shaft of the femur and the shaft of the humerus and the intracapsular fracture of the neck of the femur. Those fractures which seldom require open reductions are those of the clavicle, wrist and lower end of the humerus, the lower end of the leg and the lower end of the femur and of the pelvis. Many fractures when seen late are best treated by the open method as the healing process usually makes it impossible to secure an adequate reduction and there may be considerable malposition and disability due to the delay. It is best not to do open reductions on intra-articular fractures especially those involving the functional portion of the bone surfaces. Such fractures may

give fair or good results by manipulation and immobilization and open reduction helps very little. Results largely depend upon the amount of crushing and actual destruction, hemorrhage, and fibrosis.

Early joint motion is essential whether the fracture be treated by closed or open methods and by proper method of fixation one can begin joint motion much earlier. This is especially true of the Smith-Peterson operation or the multiple nailing method of Genslen or Moore in that no external fixation is used and the patient is allowed to sit up in bed on the third or fourth day, up in a chair the second week and very shortly after that he may be up on crutches without weight bearing. One can see the decided advantage in this, in that there is less chance of hypostatic congestion of the lungs and older people can always do better if they are allowed a slight amount of activity. There is very little danger of pressure sores and the often fatal fibrillation into which these arteriosclerotic hearts are thrown.

Skeletal traction with metal pins and wires has not been mentioned. Only direct fixation of the fracture itself has been discussed, although it appears that when one transfixes a bone or bones by pins one has done an open operation on bone with about the same danger of infection as by operating on the fracture itself. In fact, such procedures are often neglected in after-care. I have had a woman's thigh amputated because of an osteomyelitis which developed six weeks after skeletal traction was applied.

In reading the literature about open reductions of fractures we are often confronted with the statement that such proceedings should be carried out by surgeons specially trained in this type of work; however, it is my belief that any well-qualified surgeon under our present methods of aseptic surgery is capable of doing open reductions of fractures.

Nutritional Requirements in Pregnancy

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ALTHOUGH much valuable research has been carried out on the problem of the nutritional requirements in pregnancy, it is only within recent years that we have begun to apply these findings to obstetric practice. These studies have served to make us more cognizant of the fact that a pregnant woman has special requirements which should be fulfilled during her pregnancy. In the present period of economic stress, it is often difficult to adjust the food allowances so that the pregnant patient may receive a diet adequate both in quantity and quality. An adequate protective diet is an important part of good prenatal care, and thus it becomes the duty of the attending physician to instruct his pregnant patients so they will know in certain terms what is meant by an adequate protective diet. It has often been pointed out that many of the complications and disabilities associated with pregnancy, labor and lactation are due directly or indirectly to improper or inadequate nutrition. This often begins in the early prenatal period, especially with multiparous, overworked women and with women who are naturally substandard or chronically undernourished. There are still some misconceptions among medical men as to what constitutes the nutritional needs of the pregnant state. In general this question may be answered by the statement that the mother should be supplied with the various foods necessary for her own metabolism, and in addition those needed for the growth and development of the fetus.

All foods may be considered under two main groups: first, the "protective" foods, consisting chiefly of those containing protein, minerals and vitamins; secondly, the "energy bearing" foods such as carbohydrates and fats. The ideal diet includes sufficient protective foods to prevent the development of deficiency diseases, as well as the proper proportion of energy bearing foods to maintain the growth and activity of the body. Today, we rarely see actual starvation from lack of sufficient calories. The real danger lies in the fact that individuals in the low income group are forced to substitute the lower priced carbohydrates for the higher priced foods containing protein, minerals and vitamins.

PROTECTIVE FOODS

The highly protective foods include milk, cheese, eggs, meat, butter, fresh green vegetables, and raw ripe fruit. Sunlight may also be considered an adjunct to the above list because it generates Vitamin D in the organism. Milk has long been considered as a valuable food for pregnant and lactating mothers as well as nursing babies. A committee report of the League of Nations on the relation of nutrition to health states that the use of the milk from cows or other mammals in the diet of the human race is as old as the history of mankind, and during the long ages in which it has been thus used its

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value has ever been highly esteemed. A land "flowing with milk" was the ideal of pastoral tribes in ancient times and will still remain the ideal if the balancing of nutrition and health of the people receive due consideration. The report continues with the statement that modern scientific research has entirely confirmed the empirical conclusion drawn from human experience as to the dietary value of milk. Milk, which is designed to afford complete nutrition to the mammalian young, is known to contain all the factors necessary for satisfactory nutrition combined in a suitably proportioned mixture of protein of good quality, fat, carbohydrate, mineral salts and vitamins. In this respect, milk is the nearest approach we possess to a perfect and complete food. No other food that can be used as a substitute is known. The administration of calcium in any form or dosage cannot completely replace milk. The patient who will drink one quart of cow's milk daily during pregnancy and lactation will satisfy her calcium and phosphorus requirements in a form which is especially easy of absorption and assimilation. In addition, she will obtain valuable protein food, in the form of lactalbumin and casein, both of which are not only present in large quantities but possess a highly nutritive value. We must also be mindful of the fact that in milk there is no loss of protein by cooking, such as occurs with the protein of muscle meats.

Cow's milk will vary in its vitamin content with the seasons of the year. In the northern temperate climate the reduction of vitamin D in cow's milk during the winter is easily overcome by the daily administration of two or three teaspoonfuls of cod liver oil or its equivalent. It is neither necessary nor desirable to give large doses of cod liver oil or its concentrates routinely to pregnant women. Vitamins are not a panacea for all the ills that beset women during pregnancy. Just as in all other conditions, judgment must be used in their administration. Naturally, associated fever or vomiting or previous diseases which have produced weight loss and inanition may call for special measures and larger dosages until equilibrium is attained. There is accumulating evidence to the effect that increased ossification of the fetal skull, leading to a higher incidence of dystocia, may be due to excessive calcium and vitamin therapy. Increased calcification of the placenta also has been shown to be produced by excessive administration of calcium and vitamins.

It must be understood, however, that certain women present more or less chronic deficiencies of iron, protein, calcium and vitamins; and just as they need large doses of iron, so a few may need temporarily, at least, large doses of vitamins. If we will spend the time to evaluate the condition of the tongue, examine the fingernails and determine the presence or absence of free

TABLE I.
Nutritive Value of Foods

FOOD	"Good" Protein	Minerals	A	B	C	D	
Milk	++	+++	+	+	+ ϕ	+ ϕ	} Highly protective foods
E Cheese	+++	+++	+	+	—	++	
E Eggs	+++	+++	+	++	—	++	
E Liver	+++	+++	+	++	—	++	
E Fat fish (herring, etc.)	+	—	+	+	—	++	} Less protective foods
Green vegetables	+	+++	+	+	++	—	
Raw fruit	+	+++	+	+	++	—	
E Butter	—	—	++	+	—	+ ϕ	
E Cod liver oil	—	—	+++	—	—	+++	} Non-protective foods
Yeast	+	+	—	++	—	—	
Meat (muscle)	+	%	—	+	—	—	
Root vegetables, tubers	+	%	+*	+	+	—	
Legumes (dry peas)	—	—	—	+	—	—	} Non-protective foods
E Cereals (whole meal)	+	%	—	+	—	—	
E Cereals (white bread)	—	—	—	—	—	—	
E Cereals (polished rice)	—	—	—	—	—	—	
E Nuts	%	—	—	++	—	—	} Non-protective foods
E Sugar, jam, honey	—	—	—	—	—	—	
E Margarine, olive oil and other vegetable oils	—	—	—	—	—	—	

E = foods of high energy value
 ++ + signifies very rich
 + + signifies rich
 + signifies present

% signifies present in traces
 — signifies absent
 ϕ signifies in summer
 * signifies if yellow in color

hydrochloric acid in the stomach and determine the hemoglobin level in the blood, we will gain then a valuable estimate of our patient's dietary efficiency.

Cheese, which may be considered as concentrated milk, contains the good protein as well as the calcium salts and vitamins of milk. Small portions of cheese may well be included in the diet two or three times a week. Butter is also a valuable food because it is composed of the most easily digestible fat, and is an additional source of fat soluble vitamins A and D.

Eggs are another important source of good protein as well as valuable minerals and vitamin B. They are usually well tolerated and may be prepared in a number of ways to entice the individual who will be benefited by them.

While ordinary muscle meat is inferior to milk or eggs in nutritional value, it does serve as an important source of protein and iron. We are all aware that many of our patients are instructed by their lay advisers to eat little or no meat during their pregnancy. The results of these curbstone consultations are undoubtedly reflected in some of the anemias seen during pregnancy. It is estimated that two grams of protein per kilo of body weight are needed by the maternal organism and the growing fetus. The daily requirement of protein for the patient of average weight would, therefore, be between 130 and 150 grams. It is also important to encourage the use of liver, kidney, and sweetbreads since they are rich in minerals and vitamins not found in muscle meats.

An additional source of protein is to be found in vegetables, particularly peas, beans, and cereals. It is believed that a high protein diet is particularly valuable in the pregnant woman because it raises the prothrombin

and fibrinogen content of the blood, thereby offering some protection against hemorrhage. Patients with an inadequate protein intake may be expected to develop edema, anemia, lowered resistance to infection, and inadequate lactation.

Green, leafy vegetables and raw ripe fruits are highly acceptable, particularly because of their vitamin A and B content. They also contain the antiscorbatic vitamin C if taken in the uncooked form. The abundance of minerals adds greatly to the value of vegetables and fruits. Calcium is found to be present in oranges, while grapes and apricots are rich in iron.

In many parts of the world it is desirable to complement the vitamin intake, especially during the winter and spring months, by the administration of cod liver oil or other fish liver oils. Some of the vitamins taken by the patient will be lost, however, if she routinely uses mineral oil to overcome constipation, the fat soluble vitamins A and D being soluble in mineral oil.

In goitrous regions it is advisable to recommend either the use of iodized salt or two or three minims of Lugol's solution a week.

ENERGY-BEARING FOODS

The energy-bearing foods include cereals in their various forms, sugar, potatoes and fats. These foods should be added to the protective foods in a quantity sufficient to satisfy the energy requirements during pregnancy. An analysis of the cereal foods reveals that many of their valuable elements are lost in the process of milling. White flour, for instance, is rich in carbohydrate but lacking in the B vitamins contained in the husk and germ of the grain. There is also a definite reduction in the mineral content of the highly milled grains when the bran and germ are cast off. The accompanying table

TABLE II.
Mineral Composition by Weight of Wheat and
Wheat Products

	Whole Wheat	Wheat Flour (white)	Wheat Bran	Wheat Germ
Potassium	0.473	0.115	1.217	0.296
Sodium	0.039	0.060	0.154	0.722
Calcium	0.045	0.020	0.120	0.071
Magnesium	0.133	0.018	0.511	0.342
Phosphorus	0.423	0.092	1.215	1.050
Chlorine	0.068	0.074	0.090	0.070
Sulphur	0.005	0.177	0.247	0.325
Iron		0.001	0.008	

shows clearly the relatively large amounts of minerals in wheat bran and wheat germ as compared with those in white flour. A finely textured white bread is produced at the expense of these valuable constituents.

It is apparent that there is some variation in the value of the different carbohydrate foods. Sugar and milled cereals predispose to dental disease when introduced to people in remote districts or countries where tooth decay was previously unknown. Contrary to popular belief, potatoes are of distinctly more value than sugar or milled cereals, in that they do not predispose to dental caries. In addition, they are a valuable source of iron,

and, according to some authorities, retain a high proportion of their vitamin C content even after cooking. Certainly, the balance of evidence indicates that we are not solving the problem of dental caries by the administration of excessive amounts of calcium and vitamin D. Proper dental hygiene and eating of foods that require more chewing seem to be the factors which promote alveolar circulation and dental metabolism.

Another factor in the dietary management of a pregnant woman is the observation of the weight curve. A woman of normal weight is expected to gain from 25 to 30 pounds during her pregnancy, while a woman who is overweight to start with should be expected to gain less than that amount. Conversely, a woman who is underweight may well gain more than 30 pounds. By recording the average weight of the patient before her pregnancy and the weight at each prenatal visit, the physician is readily made aware of any abnormal weight gain, which will indicate one of two conditions: either an abnormally high carbohydrate intake, or an impending toxemia with its disturbed water metabolism.

The size of the fetus apparently is not affected much by the weight gain of the mother. Our present evidence indicates that the mother's metabolic rate may be a more important factor in determining the weight of the baby.

TABLE III.

Dietary Scheme for the Pregnant and Nursing Woman

A. Protective Foods.

Food	Amount	Pro- tein	Cal- cium	Phos- phrs.	Iron	Iodine	Vitamin A	Vitamin B ₁	Vitamin B ₂	Vitamin C	Vitamin D	Calories	Remarks
	Grammes	Milligrammes			International Units			International Units					
MILK	1,000	32	1.2	0.9	2.4	0.02— 0.05	Rich (1,000- 3,000)	Good (50-75)	Rich	Poor	Poor	660	(a) Calculations for lean meat.
MEAT (or fish or poultry)	120(a)	22	—	0.3	5.0	—	Poor	Poor (b)	Rich	Poor	None	240	(a ₁) One-half calculated as available iron.
EGGS (one)	50	6	—	0.1	1.5	—	Rich (1,000- 1,300)	Good (about 15)	Rich	None	25-40	70	(b) Except glands (liver and kidneys) and pork muscle.
CHEESE (c)	30	8	0.3	0.2	0.4	—	Rich (800- 1,000)	Poor	Good	Poor	Poor	125	(c) Calculated as cheddar cheese.
Green and Leafy VEGETABLES	100(d)	1	0.1	—	1.2	—	Rich (1,000- 1,500)	Good	Good	Poor	None	30	(d) Estimated on basis of ½ cabbage, ½ lettuce, ½ spinach.
POTATOES	250	6	—	0.2	2.0	—	Poor	Good	Good	Good	None	250	(e) Calculated as beans.
LEGUMES, Dried	10(e)	2	—	—	0.2	—	Poor	Good	Good	None	None	35	
COD LIVER OIL	3.5	—	—	—	—	—	Rich (1,800- 3,500)	None	None	None	Rich (about 300)	30	
An available source of Vitamin C (from raw fruits and vegetables)						—				To yield 250-500			
TOTAL YIELD		77	1.6	1.7	10.2	Adequate	Over 5,000	Over 150	Adequate	Over 500	About 300	1,440	

B. Supplementary energy-yielding foods by means of which the individual's energy requirements can be met.

CEREALS as needed:													
Highly milled, or Whole Grain	250(f) 250(g)	28 —	— 0.1	0.2 0.9	2.5 9.0			Rich (about 250)				1,000 1,000	(f) Calculated as white flour. (g) Calculated as whole wheat.

FATS as needed.
SUGAR as needed.

The estimates are based on data in Sherman's "Chemistry of Food and Nutrition," 4th edition, 1933. The figures for milk are calculated for a content of 3.2% protein and 3.5% fat. The figures for vitamins, however, are converted to international units and must be regarded as rough approximation only.

SUMMARY

1. The diet of the expectant mother should include a quart of whole milk daily, to furnish the necessary calcium and phosphorus as well as good protein and vitamins.

2. A generous helping of meat is necessary for an adequate protein intake. The lay and medical advice to avoid meat has been very pernicious.

3. Eggs and cheese will furnish additional protein and valuable minerals.

4. Fresh, leafy vegetables and raw ripe fruit are necessary for their vitamin and mineral content. The vitamin needs should be determined for each individual.

5. The vitamin content of the diet should be conserved by avoiding the routine use of mineral oil.

6. In goitrous regions small doses of iodine are valuable adjuncts to the dietary.

7. The substitution of coarse cereals and potatoes is to be recommended to replace the highly milled cereals and sugars.

8. Small doses of cod liver oil are of definite value during the winter and spring months.

9. The routine use of large doses of calcium and concentrated vitamins should be condemned.

10. Observation of the patient's weight during pregnancy will indicate excessive gains, as well as give warning of impending complications.

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Clinical Notes of the Interstate Postgraduate Association

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DURING the summer of 1940 the Interstate Postgraduate Association conducted their annual American Clinical tour starting at Rochester, Minnesota. There is no point in discussing the three days spent at Rochester as everyone in this section has, or should have, first-hand knowledge of the work done there.

At Chicago we visited Northwestern, Rush, and the University of Illinois.

At the Northwestern medical school Dr. Davis did a decompression operation for brain cyst. After reflecting a large pedical flap, a deep-seated cyst was aspirated and with a diathermy loop, considerable brain tissue over the cyst was removed. The bone flap was replaced without drainage. Dr. Koch operated for a flexor contracture of the hand and wrist due to an ulnar nerve injury. A large scar was dissected from above the elbow down to the wrist, and the nerve exposed. A neuroma of the nerve near the elbow was resected, followed by an end-to-anastomosis. The nerve was transplanted in front of the condyle. A tourniquet was used to control bleeding. This was released from time to time as the operation took about four hours to complete. Silk sutures were used throughout.

At the Presbyterian hospital Drs. Vernon C. David, Kellogg Speed, Herman L. Kretschmer, and N. Sproat Heaney gave us an instructive clinic followed by a pathologic conference conducted by Dr. C. W. Apfelbach, pathologist. Their pathologic material was well worked up and was thoroughly discussed. Many postmortem X-rays are taken, both of the chest and of the lungs after removal at autopsy. They have two pathological conferences each week. Dr. Apfelbach stated that the common causes of paralytic ileus are: (1) trauma; (2) dehydration; (3) fat embolus. Dr. David stressed the frequency of fat emboli in that they are present in 30 per cent of autopsies.

Dr. Speed operated a case of ossifying myositis removing several bony formations pressing on the ulnar nerve at the elbow. The nerve was transplanted anterior to the condyle and several bony growths removed. Dr. Speed thinks that X-ray never shows more than 60 per cent of pathology of the bone. He also presented a young man on whom he had amputated the leg at the thigh. A pair of Wyeth's pins were shown which he recommended for this type of operation. In this case he did not use the pins but instead did a primary ligation of the femoral artery at Poupart's. He stressed that

care must be taken to ligate the artery above the profunda in order to control bleeding. Then by elevating the leg, much of the blood in the leg can be saved.

Dr. David showed slides of polyposis of the large bowel. These are due to inflammation and often degenerate into cancer. He thinks that the characteristics of cancer are invasion and ulceration, and not hyperplasia.

Dr. N. Sproat Heaney, gynecologist, did a vaginal hysterectomy, removing a cystic ovary on which he showed us an implant of endometrial tissue. He stated that many well informed physicians do not know what endometriosis is. It is displaced endometrial cells which change during menstruation causing pain and tumor formation. It is not an uncommon cause of painful menstruation. These often occur in the abdominal wall by transplantation following cesarean operations. Many occur on the surface of the uterus, ovary, or peritoneum. He reported a case of endometriosis of the bladder. Many occur in umbilical herniae; they are benign tumors. In cases where one cannot remove the tumor, the pain will be relieved by removing the ovaries. Endometrial tissue is often present in fibroid tumors. Dr. Calcock of the Lahey Clinic at Boston, also gave a talk on endometriosis. He said they find it in one Boston hospital, and none in a hospital across the street. He reported 19 treated cases; defined it as endometrium outside the cavity of the uterus. It may occur in the muscle, bowel, lung, appendix, bladder, broad ligaments, etc. Four cases caused obstruction by closing the sigmoid. It is supposed to come from the cavity of the uterus at the time of menstruation. It may spread through the blood stream. Pain is aggravated at the menstrual period. Many have dysmenorrhea. Many fibroids are due to endometriosis. Sterility is present in 40 per cent of the cases. A tender mass in the cul-de-sac is the most common symptom. Dr. Broders does not believe that chocolate cysts are due to endometriosis. In women over 40, castration is the treatment; also removal of the uterus. Under 40, conservative treatment should be tried. Seventy per cent of their cases are treated radically.

Dr. Falls, gynecologist, operated upon several patients at the Illinois University. In one case of cancer of the uterus he applied 2500 milligrams of radium. He attaches it to a wire, stating that once the string broke. Repeated treatment is given until 8000 R. X-ray units are given. He does not do Wertheim operations in his clinic and said some of the men even question the advisability of hysterectomy in cancer of the fundus. Dr. Falls thinks he can diagnose cancer of the fundus by curettage alone, by the Park's test, i. e., abnormal bleeding. In one case which he did, the bleeding was slight so he pronounced it negative for cancer. No scrapings were taken and the cervix was cauterized with an electric soldering iron. He thinks fibroids are potentially malignant and all should be removed. Dr. Falls did a second stage operation for cancer of the rectum located just above the anus in a woman 54 years of age. A primary colostomy had been done. He did a posterior resection under spinal anesthesia. The anus was closed

with subcuticular stitches of silk. The point stressed was that one should not do a sleeve type of operation in cancer of the rectum because it is impossible to get control, and at the same time cure the cancer. Dr. Falls, in doing a vaginal hysterectomy, said he had a unique way of finding the uterine artery. He found it with the scissors. When cut, the artery spurts and then can be seen. Non-absorbable sutures were used to hold the bladder in place. He used a small Mayo table in his lap and against the operating table to hold instruments. This simplified reaching for instruments. The broad ligaments were sutured to the vaginal vault to prevent prolapse.

At the Crile clinic they presented a paper on synthetic crystalline adrenaline cortical hormone known as "Desoxycorticosterone". It does not completely replace the cortical secretion. It will cause massive edema if large doses are used, and will also cause hypertension. It is used in pellets of 600 to 700 mg. planted under the skin. A paper on menorrhagia was presented. Menorrhagia differs in young and old. In the young it is not necessary to do a curetment in order to rule out cancer; while in middle age it should always be done for diagnostic purposes, and it also gives a fresh endometrium. One may try antuitrin, also estrogenic hormone. One may use testicular hormone to stop bleeding during the menopause. Do not give so much that the voice changes and a beard starts to grow. Dr. Brown of Montreal uses 5 mg. of progesteron in four doses for bleeding. Progyon B, 1500 units, is also used. Usually estron and progesteron will control bleeding. If medical treatment fails, radium may be used. One should not use radium in young women; it is better to do a hysterectomy. During the menopause they recommend large doses of estrogenic hormone.

In the urological clinic at the Presbyterian hospital we were shown X-rays and prepared specimens of vesiculitis. This disease often is not recognized and is usually called gleet. These are successfully treated by dilatation of the ejaculatory ducts. Dr. McCarthy of New York has invented an instrument for this purpose.

At the Cook County Hospital Dr. Kole did a splenectomy, first tying the artery. Then, by gently squeezing the spleen he attempted to conserve the blood within the organ before ligating the vein. Dr. Kole also operated on a patient with pancreatic cyst. Calcium deposits were found in the cyst wall. The edge of the sac was sutured to the peritoneum and drained.

Dr. Cecil lectured on rheumatoid arthritis, differentiating this disease from gonorrheal arthritis and joint changes following fractures and oostearthritis. He said the focal infection theory as the cause of rheumatoid arthritis is on the way out. In his series, the patients became worse after removing the teeth, tonsils, etc. Sulphur treatment has proved to be of no value. Vaccine helps some but it is no cure-all. The best treatment to date is gold salts injected deep into the muscle. He thinks this is better than by vein. The treatment recommended is one dram injected once a week for seven to eight weeks, then rest and repeat. We were warned

against reactions such as gastro-intestinal disturbances, skin eruptions, shock, etc. Heat treatment has proved disappointing; sulfanilamide is helpful. One man in New York treats children with one gram sulfanilamide daily for seven months to prevent recurrence of rheumatic attacks. Vitamin D is advocated and seems to help but is not as good as was first thought.

Dr. Oldberg, Professor of Surgery at Illinois, in commenting on tax supported institutions, said they could get all the money they wanted. They recently bought \$150,000 worth of radium.

After visiting the three universities one is impressed with the change that is taking place in medicine. Not many years ago Rush was considered the leading school, Northwestern next, and the University of Illinois a poor third. Now the first two with their shrunken endowments are outclassed by the tax supported institution.

The pathological conferences at the University of Illinois were refreshing. Students took part freely and discussion was very informal. The internes gave brief histories, the pathologist showed gross specimens and microscopic sections were quickly flashed on the screens. Discussions were lively and gentle digs kept everybody alert.

At Cleveland we spent the day at Dr. Crile's Clinic. Dr. Jones did a combined abdominal and perineal operation for cancer of the rectum in one sitting. First the inferior mesenteric was ligated and with a pair of special scissors about one foot long, he quickly loosened the sigmoid rectum, saving enough of the peritoneum to close off the pelvis. The abdomen was closed with a figure of eight steel wire. No stay sutures were used. The skin incision was covered with silver foil. The colostomy stump was left free as he said the stitches would pull out. The patient was then turned over on the table and the peroneal part of the operation was done quickly. An iodoform gauze pack was placed over the prostate. A rubber dam packed tight with gauze was used to fill the cavity. This should be removed in three days and followed by irrigations. When the lesion is in the ampulla, it is not necessary to remove so much skin. A transfusion was given during the operation with the needle placed in the vein of the ankle. Dr. Jones has tried transfusions before, during, and after the operation. He thinks the best plan is to give it during the operation. In over 400 he has not had a case of plebitis.

He presented a case of total pneumonectomy for bronchogenic carcinoma. This man received no postoperative X-ray. At the Crile clinic they do not use X-ray following surgical removal of carcinoma, not even in breast cases. We were shown one case of chronic intussusception of the right colon that was mistaken for cancer. This mistake is frequently made. The colon X-ray with contrast films may help make the differential diagnosis. One should do stool examinations, proctoscopic examinations and colon X-rays when there is any change of bowel habit. We were given a demonstration in the use of gastroscopy. They had twice been able to diagnose

cancer of the stomach with the gastroscope, that could not be shown by X-ray.

Dr. Jones showed one man in whom he had done a total gastrectomy. The jejunal loop was anastomosed into the esophagus before removing the stomach. In this case he passed a Miller-Abbott tube down into the jejunum before closing the abdomen.

At the Crile clinic a paper on shoulder pain in coronary disease was presented. It is thought to be due to sensitization of fibers of the brachial plexus. It may last for weeks and may result from unrecognized myocardial infarction. Upright posture, aminophyllin and morphine sulfate were advised. It was stated that aminophyllin is very useful in bronchial asthma.

A case of headache due to cervical arthritis was presented. Next to eye strain cervical arthritis is the most frequent cause of headache. It is usually occipital, often occurs in the morning and may follow a draft. There is usually tenderness in the neck at the attachment of the trapezius muscle. It is usually relieved by aspirin. Treatment by low carbohydrate diet, vitamin B, local heat, thyroid extract and orthopedic measures were recommended.

A paper was presented on the use of A. T. 10 in disturbed calcium metabolism, due to parathyroid deficiency. A. T. 10 is prepared by irradiating ergosterol. It comes in ampoules (1 cc. - 5 mg.), is quite expensive—5 ampoules \$8.00. Large doses of calcium lactose plus vitamin D were given. Six patients have been treated. Ten cc. A. T. 10 was given using a daily dose of 1 cc. Serum calcium rose to normal while serum phosphorus decreased. The remedy in each case was very effective. Trousseau's sign, i. e. tetany, indicates when an overdose is given. The drug has an accumulative action, and when an overdose is given, one may give parathyroid extract.

We were told that the rupture of the intervertebral disc usually occurs at the fourth or fifth lumbar. It is often the cause of low back pain which may radiate down one leg along the lateral aspect of the thigh and foot. It usually ruptures through the ligamentum flavum posteriorly. Rest in bed relieves the pain temporarily. The patient usually stands with a list to the opposite side. The straight leg raising test is very painful. There is a point of tenderness, also sensory changes. Achilles reflex is usually absent or diminished. The spinal fluid should be examined for protein contents. The normal is 40 mg. per 100 cc. This is always increased to 60 or 100 mg. per 100 cc. Lipiodol or air injections may be used to locate pressure points. They now use thorotrast as contrast media.

At the Crile clinic we had a paper on treatment of ulcer with aluminum hydroxide. This medication can be used a long time. It will combine with twelve times its volume of acid. It is also used in obstruction and massive hemorrhage from the stomach. In severe cases it may be used in continuous drip through a collapsible latex tube. Lately, in place of a continuous drip, they have used the method, awakening the patient often

and giving it by mouth when there is a high acid curve. Creamalin tablets may be used but they are not quite as good as the amphojel. The tablets cost the same as the liquid. In cases of obstruction, use nasal suction and drip of aluminum hydroxide. Also do twenty-four hour chloride determinations in urine until 5 to 10 grams per 100 cc. are obtained.

At the Western Reserve University at Cleveland, the Miller-Abbott tube was used extensively in all forms of obstruction. By the use of this tube, surgery can be delayed until the fluids are replaced. One case of obstruction due to endometrial tissue in the bowel was presented. One can feed through this tube, and by passing it on into the small bowel, often the site of obstruction can be located. In case of gastric resection, the tube can be introduced beyond the stomach before closing the abdomen. Often the tube comes out of the rectum. When the tube is used one must check its progress by repeated spot films or fluoroscopic examinations. There is a trick in passing the tube. It is first passed into the stomach, then the patient is turned on the right side, and suction is started. Then the tube is passed 8 cm. beyond the stomach mark, where it is left until it passes the pylorus which usually takes about four hours. From then on one must feed it slowly, about 3 cm. every hour. In this way, it will pass into the small intestine in from four to twelve hours. The tube does not usually relieve obstruction rapidly. Frequent X-rays should be taken until the tube is beyond the pylorus. From then on one can usually recognize the place where the tube is by the contents aspirated. If the tube is in the duodenum, by inflating the bag one can usually feel the contractions. One can introduce a second tube into the stomach if desired. By the use of three bottles one can keep the fluids clean, and the aspirated contents are collected in the third bottle. The tube is made by Pilling.

The Western Reserve University at Cleveland is a privately endowed institution. At the Western Reserve hospital a varied program was presented. We saw gastric resection, congenital hip, nerve section for tic douloureux, hernia, etc. Dr. Halloway did a beautiful sleeve resection for cancer of the stomach. All the surgeons in this hospital used suction in place of sponges to keep the operative field dry. They usually used a small metal or glass tube to suck blood out of the wound.

Dr. Heiney gave us some practical points on anemia. In pernicious anemia the red cells are usually irregular. The white count is down around 5,000 or under. The differential is important. The polymorphonuclear cells are reduced in number and the lobes are increased to 7 or 8. One also finds a few young white cells; myelocytes and lymphocytes shift to the left. Red blood platelets are reduced as can be seen on a blood smear. If the white count is up, one finds more myelocytes. The patient may have neuritis, vitamin B deficiency, sore, smooth tongue intermittently. This is important. The tongue must be smooth in the central part, and the soreness intermittent. The disease does not occur in negroes. The gastric analysis gives no free hydrochloric acid.

Hypoplastic or aplastic anemia can be recognized by bone marrow examination, which does not contain cells. This type of anemia does not respond to liver therapy. The history is very important. In most cases the patient has been exposed to benzene or allied drugs. An increase of normoblasts is very characteristic of metastatic carcinoma.

Myasthenia gravis is characterized by weakness, loss of weight, difficulty in swallowing, and ptosis of the eyelids. The electric response is characteristic. Prostigmin is the drug of choice and the diagnosis can often be made by the response following the use of this drug. Persistent thymus is thought to have something to do with the disease. In one case, which finally failed to respond to prostigmin, a thymus was found at autopsy. Tumor of the thymus is sometimes present. The disease is characterized by high creatinine in the urine, often 250 mg. per 100 cc. None is found normally. These patients often die from respiratory failure. Surgical removal of the thymus is probably the proper procedure. X-ray is of doubtful value but may help. Prostigmin should be given before and after X-ray and surgery. Dr. Heiney thinks the drug acts on the nerve supply and controls the production of acetyl chloride. Eight cases operated upon are reported in the literature with four good results.

Dr. Beck thinks there are many indications for air study in brain lesions. He gives the patient 3 to 5 grains phenobarbital before doing the encephalogram. He injects oxygen rather than air by lumbar puncture with a 20 cc. syringe, playing it back and forth. X-rays were shown of dozens of cases. They have not had any deaths. It is a very valuable method of determining intracranial lesions, and should be used routinely in the diagnosis of intracranial lesions.

We were given a symposium on the heart. Sudden death is like turning the ignition off in a good automobile. Life equals oxygenation. Ventricular fibrillation is practically always fatal. However, now one can defibrillate any dog's heart which has not congealed by using novocaine and electric stimulation. One must open the chest, inject 2 cc. novocaine into the right ventricle while pumping the heart with the hand. When adrenalin injections alone start the heart, it is in standstill and not in fibrillation. If it fibrillates one must use novocaine and mechanical rest. Three minutes and ten seconds is the longest time a heart can stand still without death of the respiratory centers. One must get the hand on the heart and keep pumping when defibrillating the heart. They have done some 10,000 experiments on dogs at Western Reserve in solving this problem. Dr. Beck has now succeeded in defibrillating two human hearts by this method. He was able to start the hearts and keep them going for about five hours by pumping the heart while artificial respiration was continued. Both of these patients had been dead about nine minutes and both finally died from respiratory failure. The respiratory center dies after circulation has stopped for three minutes. Both of these cases were people who died anesthetic deaths on the operating table. Dr. Carl J. Wig-

gers of the same medical school has experimented on dogs and succeeded in restoring normal rhythm in ventricular fibrillation by using a series of electric shocks one or two seconds apart.

Dr. Beck has also experimented on trying to increase the blood supply to the heart muscle in coronary disease. Many investigators have experimented along this line using omentum, muscle, fat, etc. The question is, can you supply blood through any tissue? He has been able to produce anatomical communications between the coronary and grafted vessels. He showed us injected specimens to prove this.

Dr. Beck has devised an operation for angina pectoris. He presented Mr. Body, a painter, on whom he had performed this operation one year ago. Mr. Body said before the operation he could walk only a half a block before he had to stop on account of angina attacks. He was obliged to take nitroglycerine. Since the operation he has worked forty hours per week and only if he works too hard does he develop pain. He can now walk twelve to fourteen blocks. Dr. Beck has operated on a series of these. He limited the operations to those not benefited by medical treatment. At first this operative mortality was one-third. He has now thirteen improved cases and has decided not to do any more until these have died so he can get autopsy findings. Only three of these have died so far. One died of apoplexy and in this case he was able to demonstrate barium going across into the graft when the coronary artery was injected. His operation consists of removing the ribs, transplanting the pectoralis major muscle, with blood supply intact. He sutures it to the heart after scarifying the heart muscle by cutting off the epicardium.

At the New York Postgraduate hospital Dr. Erdman operated on a woman with cancer of the stomach. He did Polya's type posterior gastric resection with a short loop, also removing the gallbladder at the same time. A machine was used to amputate the stomach. Before closing the last stitch in the peritoneum, he poured two quarts of saline into the abdomen through a funnel and then as this was withdrawn, quickly tied the last stitch so as not to lose any of the fluid. This is an old stunt of thirty years ago, but not used so often in this age of intravenous solutions. He also sutured a Levin tube into the mucous membrane of the suture line with catgut.

Dr. Straetsura of the New York Postgraduate hospital did several operations on patients for reconstruction of the nose. On one patient with a saddle nose, he re-fractured the nasal bones at the ridge by using a small chisel subcutaneously. Through a puncture wound on each side at the base, the nasal bones were refractured, and by manual pressure the broad nose was narrowed up. A Jacob's clamp was then applied to hold the bones in place. Later he expected to transplant a cartilage to elevate the ridge of the nose. This cartilage was removed from the costal cartilages with a curved rongeur and transplanted under the skin to develop its blood supply. In a second case with too large a nose, he resected portions of the cartilages from each wing of the nostrils,

then with a sharp chisel resected a portion of the ridge subcutaneously. To correct the droop of this nose, he loosened the frenum and stitched the point of the nose higher on the septum. He did not use any internal splints.

Dr. Russell did a radical breast which had previously had X-ray treatments. He also did a splenectomy for Gaucher's disease. He said it did not cure but gave relief. Also he did a gallbladder, hernia and Torck operation for undescended testicles. A case of polynoidal cyst was operated. He warned against injury to the fascia or it will take much longer to heal. The wound was packed with iodoform gauze, not because it is an antiseptic, but because it does not smell so bad after a few days. As soon as the pack is removed, baths are given once or twice daily.

At the Lahey clinic at Boston we were told that they open the common bile duct on an average of once in every four or five gall-bladder operations. They do most of the gall-bladder operations under spinal anesthesia. The common duct is probed and the opening into the duodenum is dilated up to number 6. They use synthetic vitamin K to bring prothrombin to normal, usually giving it intravenously. T-tube drain is placed in the common duct for eight days. Dr. Lahey still uses cyclopropane anesthesia, but mixes it with ethylene. He has had a fatality by explosion, but still insists that the advantages of this anesthetic outweigh its disadvantages and he thinks he will be able to overcome its danger. He has had no deaths when the cyclopropane has been mixed with ethylene.

Dr. Mushall at the Lahey Clinic stated that duodenal ulcer cases must avoid liquor and smoking. They only operate on 8 per cent of duodenal ulcer cases. He does not believe that gastric ulcers turn malignant. Any lesion on the greater curvature is probably malignant while those on the lesser curvature are usually benign. They do a subtotal gastrectomy in 80 per cent of gastric ulcers operated. Before doing a gastric operation, they advised that the stomach be washed out once or twice with dilute hydrochloric acid. In patients in poor condition or very old, one may do a gastroenterostomy. A machine is used to cut off the stomach, then do an end-to-side anastomosis; most of them anterior. They report 107 subtotal gastric resections with only one death. Pulmonary collapse is the most common postoperative complication. These are sucked out by a bronchoscopist.

At the Lahey clinic also, Dr. Lahey gave a talk on intra and extrapleural esophageal diverticulitis. He divides them into pulsion diverticulum, which on X-ray show only a pharangeal dimple. Then if there is a neuro failure, one has a pinch-pocket action. They are covered by the cricopharyngeus muscle which exerts a downward traction causing obstruction at the neck. The patient may regurgitate food at night and cause lung abscess. He has operated 126 cases of this type with one death. All are done in two stages. At the first stage he separates the diverticulae, taking care to separate fibers at the neck, then he stitches the sac up so that it empties by gravity. The second stage of the operation

takes place a week later when the sac is cut off. The mucosa is not stitched, but the opening is packed and drained upward. All should be dilated six weeks later with a Plummer bag. The second type are the traction type and simple dilatation will cure. The third type are diverticulæ just above the diaphragm. He has operated four such cases. They have pain and decayed food. They are intrapleural and are dangerous because they may perforate. They are operated through the pleura at the eighth rib on the upper side. The sac is separated to the neck, then fastened up along the vertebrae.

Dr. Curtain at the Lahey clinic said that before the Christian era iodine was used in the treatment of goiters in China. Blood iodine is now measured in terms of microgram. One can now estimate one millionth of a microgram. The daily requirements of an individual is 150 micrograms. The normal gland contains 25 milligrams of iodine. Exophthalmic goiter is in a negative iodine balance. In myxoedema the tissues are unable to change the iodine into an organic form. They have now made 6000 blood iodine determinations in patients.

Dr. Adams showed a case in which he had done a lobectomy for bronchogenic carcinoma. An early symptom is cough. Later, bleeding and loss of weight. Most cases are diagnosed too late.

Dr. Joslin showed us a Berger postural board, an inclined board on which a patient with Berger's disease elevates the leg. The leg was elevated high up for two minutes, then down for six minutes, and so on. He also showed us an automatic occlusion cuff which cut off the diastolic pulse for two minutes, automatically released it for six minutes, and so on.

In diabetic foot infections they use the cloven foot method of drainage so as to drain both plantar and dorsal surface. They do not use light cradles because they are afraid of burns.

One child in 2500 has diabetes, only 10 per cent of diabetes in children follow infection. The tendency toward diabetes is inherited. He thinks failure of growth in diabetic children is due to hyp-pituitarium. He gives them growth hormone. We were shown one patient, an acromegalic who developed diabetes twelve years later. The importance of the pituitary in diabetes has been known since the work of Housey of Buenos Aires. He proved that pituitary extract can destroy the islands of Langerhans. Twenty-one per cent of diabetes in acromegalics had diabetes in the family. Dr. Best can produce diabetes by an injection of anterior pituitary extract. If liberal quantities of insulin are given at the same time, no damage to the islands of Langerhans occurs. Also in fasting dogs, no damage to the islands occurs from anterior pituitary extract. Enlarged livers in diabetic children are treated by protamine insulin. To treat coma give insulin and do gastric lavage. Cataract and arteriosclerosis in juvenile diabetics are not uncommon. Fetal mortality in diabetes is about 40 per cent indicated by the amount of prolan in the blood; the normal prolan group delivers normally.

Dr. Weiss of Harvard suggested that in the treatment of low type of pneumonia, one should combine drugs and serum. In the high types they use the drugs alone, sulfapyridine and sulfathiozole. They stop the drugs early to avoid toxic effects with sulfathiozole. One may get suppression of urine. They use sulfathiozole more than sulfapyridine. When both the drug and serum are used, they give the drug as soon as the diagnosis is made, then in four or five hours they give intensive doses of serum. Francis' test is used to determine how much serum to use. One should continue until the skin test is positive. This test is more reliable than the temperature alone. The test is made by injecting intradermally 1/10 cc. of 1 to 10,000 dilution of the serum with the tuberculin syringe. In one case he gave 70,000 units rabbit serum at 12:00 noon. At 5:00 p. m. 70,000 units more were given, and at 8:00 p. m. the Francis' test was positive. Sulfathiozole was given first and all treatment was stopped when the Francis' test was positive. He stated that the pneumococcus germ does not form toxins, but the streptococcus germ does.

At Harvard we were shown the Fenwall system of making intravenous solutions in your own hospital. The system is now used in many of the leading hospitals throughout the country. Safe intravenous solutions can be made for a cost of from two to six cents per quart. The solutions are put up under vacuum and the water-hammer test can be applied to each bottle at the time it is to be used. No doubt this system will soon be used in every hospital using large amounts of intravenous solutions. It costs about \$800.00.

Dr. Quinby at Harvard read a paper on calculi of the urinary system stressing the importance of investigating the whole patient, especially the blood values of calcium and phosphorus. The increasing number of urinary calculi is due to the widespread use of the sippy diet. The new treatment using less alkali will decrease the incidence. In making a diagnosis, pain and colic are not enough. X-ray is more reliable. Removing a stone from a kidney may range from a case so simple that the stone drops out when the pelvis of the kidney is opened to one in which you can't find the stone. In the latter case, one may have to take an X-ray of the kidney in situ. To do this, a postcard size film put up in a rubber sterile bag is placed behind the kidney and a picture is taken. This is the only sure evidence that the stone was removed, and this method will hold in court.

At the Presbyterian hospital a large skin graft on the neck was done using Padgett's machine. It looks like a distinct advance in the art of skin grafting. It was invented by Dr. Padgett of Kansas City. The highlight of our visit at the Presbyterian hospital was a demonstration of the hematocrit by Dr. John Scudder. This is a rational approach to the treatment of shock. It revolves around the potassium content of the body cells. About half of the body fluid is contained within the cells, and the composition of this intracellular fluid is quite different from the blood plasma and the interstitial fluid. The fluid within the cells contains the basic ion, potas-

sium, and the acid ion phosphates while the blood plasma and the interstitial fluid contains sodium and chloride ions. During health the pH of the blood is quite constant, but in shock, the limiting membrane of the cells is injured allowing the potassium to escape into the body fluids disturbing electrolytes and profoundly affecting the physiology of the body fluids. The amount of damage done can quite accurately be determined by taking a hematocrit reading. This is a simple way to ascertain the specific gravity of the blood. This method is said to be twenty-five times more accurate than a blood count. It tells what is taking place within the circulating fluids of the body, often as much as two days before the noxious changes become irreversible. Hematocrit readings also indicates when to use suprarenal cortical hormone. Dr. Scudder hopes that before we get into any war, at least one hundred hospitals throughout the country will use the hematocrit and become familiar with this method of treatment of shock. His book on the subject is published by Lippincott.

At the Lankenau hospital, Philadelphia, Dr. Engle reported two cases of post-pharyngeal abscesses, both caused by puncture wounds from fish bones. One was opened in the neck back of the carotid sheath. The other was opened through the mediastinum. The diagnostic signs are: first, by X-ray, the esophagus was displaced forward, and second, an air bubble forms at the top of the pharynx.

At the Temple university Dr. Fay described his method of cold treatment for cancer. He has been at it for several years and has had some success. He only admits cases that are hopeless, and most of them have had every other treatment such as surgery and X-ray. His treatment is quite expensive, and only an endowed hospital can carry it out. At first the hibernation was given in a refrigerated room, but this proved too hard on the nurses who must be in constant attendance. Now Dr. Fay refrigerates the patient between two rubber sheets like a sleeping bag which has incorporated in it 500 feet of rubber tubing. By running cold water through these tubes, the body temperature can be reduced to any temperature desired. A rectal thermometer connected with a large dial on the wall gives a constant reading. During

hibernation treatments, the temperature was kept at 85° constant for the duration of the treatment. At first these lasted for six to eight days, but lately he prefers several short treatments of one or two days each. The patient is given avertin anesthesia which lasts a long time, and when its effect wears off, the patient is in a semi-conscious state from the cold. At first he did not feed these patients during hibernation, but now gives a small amount of liquid food every six hours.

The patient must be carefully watched. Blood pressure is low, and is taken every half hour. Sometimes it drops suddenly, and the patient dies. In every case of hibernation, pain has been relieved, sometimes for as long as two years. Patients come back for treatment on their own accord. The treatment always results in a slough of the tumor, but there is no reaction, and no infection. Patients gain in weight, and often are able to go back to work. General refrigeration in inoperable cancer compares very favorably with X-ray in its ability to relieve pain. So far, no cures have been accomplished by it. Local refrigeration, however, is more successful and he has one case of inoperable cancer of the bladder who has been well for two years. The bladder was opened and a cold applicator was applied to the growth until it sloughed out. In local refrigeration, the temperature is kept constant at 40° for weeks or months. One woman with cancer of the cervix had taken refrigeration for three weeks. She said she felt much better, but could not take the treatment constantly. Another with cancer of the breast had taken local treatments for three weeks, and she said she felt better. Another with cancer of the esophagus, who previously had a gastrotomy, said her pain was relieved. The physician said she probably would die of mediastinitis when the tumor sloughed. One brain tumor was treated by trephine. The applicator was placed within the tumor for three weeks at a temperature of 40°. The tumor sloughed out, and no meningitis developed; patient later died of general carcinomatosis. One patient with cancer of the stomach improved very much at first, but finally died of generalized cancer. This method is still in the experimental stage. It is now being carried out in several hospitals, but as yet, should not be accepted as an approved method of treatment for cancer.



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CHESTER ARTHUR STEWART

It is with a mixed feeling of pride and of regret that the Medical School of the University of Minnesota accepts the resignation of Doctor Chester A. Stewart as Clinical Professor of Pediatrics in order that he may serve as Professor and Head of the Department of Pediatrics at the Louisiana State University School of Medicine.

The regrets are many and deep; for Doctor Stewart has been connected with this Medical School for more than a quarter of a century, first as a medical and a graduate student, and later as a member of the faculty. As a graduate student he received the unique distinction of being awarded Doctor of Philosophy degrees both in Anatomy and Pediatrics.

As a member of the faculty Doctor Stewart served first as an instructor in Anatomy and subsequently as Assistant Professor, Associate Professor and Clinical Professor of Pediatrics. In recent years he has been in

charge of the Out-Patient Clinic in Pediatrics and has become one of the most effective and popular teachers in the Medical School. In addition to this and the conduct of a busy private practice, Doctor Stewart has always been interested and active in clinical investigation. In fact his studies of tuberculosis in children have led to his recognition as an authority in this field. No medical school can lose such a member of its faculty without serious regret.

Modifying somewhat this sense of loss is the feeling of pride that a member of our faculty should be called to such a responsible position in another Medical School. The Medical School of the University of Minnesota is interested in the progress of medical education beyond our own University and our own State. In releasing Doctor Stewart to Louisiana State University as Head of the Department of Pediatrics, the University of Minnesota is making a significant contribution to medical education in another section of our country.

The University of Minnesota congratulates Louisiana State University on the acquisition of a Professor of Pediatrics who is certain to develop a department which will be credit both to that institution and to the one in which he served well for many years. Our loss represents a gain for the state of Louisiana and a step forward for medical education in general.

H. S. D.

DR. STEWART AND PEDIATRICS

While extending sincere congratulations to Dr. Chester Stewart on his appointment as Professor and Head of the Department of Pediatrics at the Louisiana State University, his many friends in the Northwest are keenly aware of the fact that pediatrics in this section will suffer a severe loss when he leaves us next month. The only consolation to be derived from the prospect is found in the assurance that his new post will give him a unique opportunity to organize the kind of pediatric clinic and the kind of teaching and research program that appeal most to his pioneering spirit. That he will achieve a high degree of success in this new venture, no one acquainted with his admirable qualifications can doubt.

Dr. Stewart's contributions to pediatrics have been many. As a practitioner in the field for more than twenty years he has consistently adhered to the highest professional standards. While the welfare of his little patients has always received first consideration in his daily rounds, few other physicians in our community have been more aggressive in defending the legitimate interests of the medical profession. In this respect he has been a particularly worthy representative of the pediatricians while serving in various official capacities in State and County medical organizations. He will long be remembered, in particular, for his efforts to promote public health activities, such as tuberculin testing and smallpox vaccination programs, through the agency of practicing physicians working in their own offices.

As a teacher in the Pediatric Out-Patient Department of the University of Minnesota, which he directed with conspicuous success for more than a decade, he has exerted a profound influence on the attitude of medical students and nurses toward the problems of child health. A creditable number of original scientific contributions by pediatric interns, fellows and senior students have had their inception in concrete suggestions from him.

Without question Dr. Stewart's most valuable contributions to pediatrics have been those relating to tuberculosis in childhood. In collaboration with Dr. J. A. Myers and others especially interested in the stupendous program of eradicating the disease from the entire community, he has shown that such an objective is capable of attainment. He has labored ceaselessly to obtain accurate information regarding the nature and course of the tuberculous process in children and has published numerous reports of his findings. His special insight into the problem and his many original scientific contributions toward its solution have brought a considerable amount of fame to him and his community. No better

testimony of his recognition by the leading pediatricians of America could be found than his being selected to contribute the section on tuberculosis in childhood for Brennemann's *Practice of Pediatrics*. In 1937 he was chosen to represent various American pediatric societies at the Third International Pediatric Congress at Rome, Italy, where he read a paper on this subject. As a member of the Committee on Nomenclature of the American Tuberculosis Association, he rendered invaluable service in helping to establish a rational system of classification.

As the new phase of his career unfolds in New Orleans, we are confident that the pediatricians of that community will recognize their good fortune and will throw their strength solidly behind him for the development there of one of America's most renowned pediatric clinics. His true friends in Minnesota wish him unbounded success and happiness in this thrilling adventure.

I. McQ.

ACHIEVEMENT

One rarely sees in any field of human endeavor a man who has contributed as much to the field in which he works, to his colleagues, and to society, as Dr. Chester A. Stewart. After having completed all the medical work given at the University of Missouri and having been granted the degree of Bachelor of Arts by that institution, he came to the University of Minnesota on the Shevlin Fellowship in Anatomy in the fall of 1914. For three years he worked under the direction of Dr. C. M. Jackson. His work was of such excellent quality that he was granted the degree of Doctor of Philosophy in the spring of 1917. After serving for some time as instructor in Anatomy, he transferred to the Department of Pathology, where he was instructor under the direction of Dr. E. T. Bell. In 1919 the University of Minnesota conferred on him the degree of Doctor of Medicine.

Since coming to the University of Minnesota, many of his researches had been in the field of growth. This, together with his keen interest in children and the indomitable spirit of Dr. J. P. Sedgwick, then chief of the Department of Pediatrics, resulted in work of such volume and excellency that he was granted the degree of Doctor of Philosophy in pediatrics by the University of Minnesota in 1921. Thus, the first seven years in Minnesota were devoted to preparation. During this time he taught in various departments and wrote extensively under the direction of such masters as Drs. Jackson, Scammon, Bell, and Sedgwick.

When Dr. Stewart entered the private practice of pediatrics in 1921, it was a matter of continuing what he had already learned to do so well in diagnosis, treatment, and prevention of disease, as well as compiling and analyzing scientific and clinical data for permanent record in the medical literature. He continued as a part-time member of the Faculty of the Medical School and now holds the title of Clinical Professor in Pediatrics.

Dr. Stewart is the author of more than eighty articles, which have been published in nearly twenty journals. Almost 50 per cent of his writing has been in the field of tuberculosis, and many of his observations were made at the Lymanhurst School for Tuberculous Children. Analyses of data have brought to light facts concerning this disease which proved that most opinions held twenty years ago were wrong; indeed, they have almost completely revolutionized our knowledge of tuberculosis.

When the present Editorial Board of the JOURNAL-LANCET was organized a decade ago, Dr. Stewart became a member and has contributed greatly to the development of this journal. He has not only taken an active part in the organization work but has published excellent articles in the JOURNAL-LANCET. For several years he has edited the special May issue on pediatrics in commemoration of National Child Health Day. This special issue has always been in great demand because of the fine selection and high quality of the articles. While Dr. Stewart's presence and excellent counsel at Board meetings will be greatly missed, it is a pleasure to announce that he will remain on the Board and will continue to edit the May issue of the JOURNAL-LANCET.

It would be difficult to find anyone in the entire field of medicine who has contributed more to a specialty, who has been more successful in practice, and who has transmitted more fundamental information to students and graduates in medicine and nursing than Dr. Stewart.

J. A. M.

WAR ON THE HOME FRONT

We have frequently written editorials deploring the exuberant explosion of patriotic fervor that manifests itself on the Fourth of July in the blinding of eyes, maiming of limbs, and even the taking of human lives. We usually ended our remarks with a plea for preparedness—that every physician have a supply of antitetanus shots on hand for those who failed to heed the warning even though it could not restore sight or replace lost fingers.

This year, *Star-Journal* news commentator, Cedric Adams, championed a bill in the Minnesota legislature prohibiting the use of dangerous fireworks in the state, and we were naturally pleased that the measure passed. Not only will the law have its restraining influence; the publicity given it through Cedric's columns and radio talks reached far beyond the confines of legislative halls. It drove the message home to the people, and education in a matter of this kind is far more important than legislation. Even now after the enactment of the law, education must continue. This year's celebration is likely to be more hilarious than any in the past because the law does not become operative until August, 1941, giving these who have fireworks on hand an opportunity to unload their supply. That means extra vigil because bargain prices will prevail at the last moment to insure complete disposal and destruction and an all-out war by the thoughtless participants.

A. E. H.

Book Reviews

Cardiac Classics: A Collection of Classic Works on the Heart and Circulation with Comprehensive Biographic Accounts of the Authors, by FREDRICK A. WILLIUS, M.D., M.S. in Med., and THOMAS E. KEYS, A.B., M.A., the Mayo Clinic, Rochester, Minnesota. 858 pages with 103 illustrations; St. Louis: The C. V. Mosby Company, 1941.

This attractive and stimulating volume should be of value, not only to the cardiologist but to the student and general practitioner. The work is concerned with the writings of those who have established fundamental concepts upon which subsequent progress has been made. The physician who is uninformed about the great contributions on which the art and practice of medicine is based misses much of real clinical value. Material selected deals with the anatomy and physiology of the heart and circulation, descriptions of disease, pathologic and therapeutic contributions, methods of diagnosis, and the like. Translations from other languages seem to be accurate and expressive of the authors' meaning. The value of the writings is enhanced in that with few exceptions they are reproduced in their entirety instead of being radically abridged. The classics have been presented in chronological order, each prefaced with a brief and very readable biographic account of the author, a method which brings into relief important events in the progress of cardiology and relates them to contemporary historic events.

Excellent judgment in selection has been exhibited throughout, notably by the omission of certain philosophic discussions of antiquity, of historic interest only. The first inclusion is from "De Motu Cordis" of William Harvey in 1628, trans-

lated by Robert Willis. This great work is given in extenso and is illustrated not only by a good portrait of Harvey but by a reproduction of the painting in which Harvey is shown expounding his conceptions of the circulation of the blood to King Charles I of England. The great names, portraits, biographic sketches and contributions follow one upon another in fascinating sequence. There are 51 names and 52 contributions, the double being in the case of Roger in 1879. If one looks for names, they are to be found in abundance; Hales, Heberden, Withering, Stokes, Fallot, His, Broadbent, Einthoven, Aschoff and "the beloved physician," Sir James Mackenzie, household names in medicine, are all here.

It is appropriate to begin in 1628, and likewise to end in 1909 and 1912 with contributions by William Osler and our own J. B. Herrick, respectively. The epilogue is the stethoscope song by Oliver Wendell Holmes, which ends:

"Now use your ears all you that can,

But don't forget to mind your eyes,

Or you may be cheated like this young man,

By a couple of silly abnormal flies."

The format and illustrations add much, and for short or longer reading are an added attraction.

Vitamin Therapy in General Practice, by GORDON and SEVRINGHAUS. 258 pages. Chicago: The Year Book Publishers.

The reviewer recommends this book as one of the most compact volumes of vitamin therapy that has been published. The wide experience of the Wisconsin School of Research is amply displayed in this excellent monograph. Every physician ought to have such a monograph at his disposal, inasmuch as vitamin requirements and vitamin deficiency and their curative dosages are given in detail.

Psychobiology and Psychiatry, by WENDELL MUNCIE, M.D.; Associate Professor of Psychiatry, Johns Hopkins University; 739 pages; St. Louis: The C. V. Mosby Company, 1939.

L. Emmett Holt, Pioneer of a Children's Century, by R. L. DUFFUS and L. EMMETT HOLT, JR.; 286 pages; New York: D. Appleton-Century Company, 1940.

The Henry Phipps Psychiatric Clinic opened at Johns Hopkins University in 1913 has played a prominent role in American psychiatry. For more than twenty-five years Dr. Adolf Meyer, Director of the Department of Psychiatry at Johns Hopkins, has exerted his efforts toward the building of "An American psychiatry and mental hygiene as a part of the general culture." Dr. Muncie states, "This book, written at Dr. Meyer's invitation, attempts to give a fair account of the conceptions, teachings, and working methods of the clinic as currently constituted with enough historical background to make the present understandable as a developmental product from the past to give a vision of the future."

Part I, PSYCHOBIOLOGY—The Study of Normal Behavior, is of special interest to psychiatrists, teachers and medical students. It sets forth some of the fundamental conceptions of psychobiology and gives a detailed account of students' personality studies, as carried out in the training of medical students at Johns Hopkins.

Part II, ABNORMAL BEHAVIOR—Pathology and Psychiatry, describes examination methods and contains descriptions of "the main reaction types." The case reports are presented clearly and in considerable detail with adequate follow-up studies in many instances.

Part III, TREATMENT, is a brief and clearly-stated account of the principles as well as some of the practical details in the treatment of mental disorders. There are a number of suggestions in regard to the treatment of the epilepsies and the mental disorders associated with infection and intoxication which should prove of value to the general practitioner as well as to the specialist.

Part IV, HISTORICAL SURVEY IN BIBLIOGRAPHY OF THE DEVELOPMENT OF THE CONCEPTS UNDERLYING THE PRINCIPAL REACTION SETS, contains interesting but somewhat disjointed comments in regard to the historical development of various mental disorders.

The book is a very necessary and useful account of the work being done at the Henry Phipps Psychiatry Clinic.

Macleod's Physiology in Modern Medicine, 9th edition, edited by PHILIP BARD, and nine collaborators; St. Louis: C. V. Mosby Company; 1256 pages.

The ninth edition of *Macleod's Physiology* deviates from the purpose of the earlier editions in that it is not intended as a text book of "applied" physiology. It is edited and written from the viewpoint that the greatest function of physiology is to solve fundamental problems, even if they are not of immediate practical concern. The various collaborators, representing several different medical schools, treat the subjects of the nervous system, the special senses, the circulation, the respiration, metabolism and nutrition, the alimentary tract, the endocrine glands, the distribution and regulation of water in the body and the kidney as though the material actually had gone through their minds. The result is what appear to be seasoned, conclusive presentations, acceptable by readers, with less knowledge of the subjects, as conclusive.

A gratifying feature is the paucity of annoying footnotes, all collateral comments pertinent to the matter at hand being incorporated in the text. Another helpful device is the segregation of all references to the end of the volume, listed under appropriate chapter headings. The index is adequately designed for cross reference. The table of contents gives sufficiently complete information as to the content of each chapter to be serviceable as a subject index. The subject matter is well organized, and extraneous, speculative discussion is almost entirely lacking.

Reading is made more comfortable by the use of green tinted paper, particularly so under artificial light.

L. Emmett Holt, Pioneer of a Children's Century, is a long awaited biography. Written by an able journalist, R. L. Duffus and by L. Emmett Holt, Jr., an outstanding pediatricist, it is both readable and authentic. For a quarter of a century Dr. Holt taught, wrote and practiced pediatrics. Although he had in his day what was probably the largest private practice in the world, his services extended far beyond the door of his shingle, reaching into public health particularly as it applied to children.

When he took his medical degree in 1880, one out of every four babies born in New York City died before the end of the first year. In 1924 when he died, largely through his efforts in behalf of clean milk, infant welfare stations and medical inspection in the schools, the mortality rate had been reduced to about sixty per thousand.

To parents he is best known for his still famous best seller, *The Care and Feeding of Infants*. This bible of child care has gone through 75 printings, and has been translated into Spanish, Russian and Chinese. His text book, *Diseases of Infancy and Childhood* has been used as a standard text in medical schools for over 20 years.

Dr. Holt was not a scientist in the laboratory sense. Rather he was a "middleman" of science. Closely associated with the most important research centres he was on the ground floor to learn of the newest developments in chemistry, physiology and psychology which had a practical bearing upon pediatrics. Scrupulously honest and intellectually critical he separated the grain from the chaff, and used that grain for teaching, for private practice and for public health. In a sense he was a Thomas Huxley to Herter, to O'dwyer, to Wollstein and others.

It is impossible in this short review to do justice to all of Dr. Holt's contribution to and achievements in pediatrics, but to this reviewer the lectures and clinics which he had the privilege to hear made an indelible impression.

In his day, the diagnosis of diseases in children was dependent largely upon the use of the five senses and clinical experience. Dr. Holt insisted upon meticulous and painstaking case histories. He inquired into the diet to its minutest details. The health habits were gone into hour by hour for the whole day. He especially emphasized the importance of the art of observation. It is certain that his interns and residents did not ask for laboratory and X-ray reports until they had exhausted all the known clinical methods of diagnosis. Woe unto the intern who had failed to record on the chart, a ptosis of the eyelid, an asymmetry of the legs, or a limping gait. To one who has been brought up on the axiom, "Learn to see, learn to hear, learn to smell," the modern trend to relegate the technic of observation and case history taking, to a distant past, and the over-stressing of laboratory methods, makes one want to offer a prayer for more teachers like Holt.

To the medical student who wants real inspiration towards his ultimate goal, to the recent graduate whose idealism has as yet not been frozen by success, to all doctors no matter how successful in practice whose medical lives remain unfulfilled, this life of L. Emmett Holt, a master in the art and science of Pediatrics is a "Must".

Nutrition and Diet in Health and Disease, by J. S. MCLESTER; third edition, 816 pages; Philadelphia: W. B. Saunders, Publisher.

The third revision of this volume serves to hold it in first place among the many books dealing with the application of dietary principles. There is very little that one could say other than to recommend it most highly as a reference book in any problem of dietetics. It is to be particularly commended because of the excellent physiologic approach to the problems of diet in both health and disease. The sample diets given are all excellent and well worth the appraisal of dieticians, internists, and all practitioners interested in nutritional problems.

TRANSACTIONS OF
THE MINNEAPOLIS ACADEMY OF MEDICINE

(Minneapolis Clinical Club)
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Stated Meeting Held at the Minneapolis Club, Thursday, February 13, 1941
The President, Lawrence R. Boies, M.D., in the Chair

THE PRESENT STATUS OF GASTROSCOPIC
EXAMINATIONS

R. S. YLVIKAKER, M.D.

It is not with any thought of making any additions to the literature that I bring this subject of gastroscopy before this group. Much has been written in recent years concerning this and any one can find most phases of our present knowledge well described. However, since this subject has never come before this group and since it must still be considered a comparatively new procedure, I felt that it might be worth while bringing it up for discussion tonight.

Furthermore, I would like to make it clear at the outset of this discussion that gastroscopy does not in any way replace methods of examination in use at the present time. It is no short-cut in diagnosis. In most cases gastroscopy should not be done until all possible information has been obtained by other methods. Gastroscopy should be considered as a further refinement of our present diagnostic armamentarium in gastric diseases, as a much needed and helpful adjunct.

Before proceeding further, I would like to describe the instrument briefly. The instrument now in use, as is well known, is the flexible gastroscop of Schindler and Wolfe. The latter was a physicist in Berlin and was the one responsible for the development of the intricate optical system used in this instrument. The result of the collaboration of these two men was the very ingenious gastroscop now in use, certainly the most ingenious of all the endoscopes. It consists of a distal flexible portion and a proximal rigid portion, each making up about one-half the length of the instrument. Included in the flexible portion are the short, soft rubber, finger tip which helps to guide the gastroscop in its passage through the esophagus and cardia; a short, rigid, metallic portion containing the electric bulb for illumination, the objective lens, a prism just inside the objective lens for the purpose of bending the beam of light into the direction of the shaft of the gastroscop, and then the flexible portion proper. The rigid portion consists of the distal rigid metallic tube proper and the proximal ocular portion containing the ocular lens through which the image is visualized and the electrical connections and attachments for the air channel used to inflate the stomach during the examination. Between the prism just inside the objective lens and the ocular lens there is a series of 48 lenses placed at a short focal distance from each other which allow the image coming from the stomach to be transmitted around a bend of as much as 30° without distortion. This is what makes the instrument the ingenious one that it is.

Briefly, the technic of gastroscopy is carried out in the following manner. The patient is examined on an empty stomach, usually before breakfast. About one-half an hour before the patient is seen, he is given an opiate together with atropine, usually codein sulphate gr. 1 and atropine sulphate gr. 1/120 to 1/150, by hypodermic. Before gastroscopy the throat is anesthetized with a 2 per cent pontocaine solution, to which adrenalin has been added, first by using a special curved applicator and then by injection through a special short pharyngeal tube. Following this, the stomach is emptied by means of an ordinary Ewald tube by gravity, no suction being used.

For the gastroscopic examination itself, the patient lies on a flat table on his left side. A nurse attendant holds the head in proper position. The gastroscopist then guides the tip of the instrument through the upper pharynx with the index finger and asks the patient to swallow. As he does this, the operator pushes the tip past the larynx and passage through the remainder of the esophagus is usually accomplished without diffi-

culty. Slight resistance is felt as the tip passes through the cardia, but the instrument is inserted further until resistance is again met, this usually indicating that the tip has come to lie up against the greater curvature of the stomach. This is the greatest depth to which the gastroscop can be passed. A small amount of air is then forced into the stomach and search is made for the landmark of the angulus, usually in the 10 to 11 o'clock position of the objective. The angulus appears as a convex, curtain-like fold covering the upper portion of the field. In long, fish-hook types of stomachs, this fold becomes very prominent and may interfere, to varying degrees, with visualization of the lesser curvature of the antrum and pylorus, whereas in high transverse types of stomachs the angulus becomes very inconspicuous and usually a splendid view of the entire antrum and pylorus is obtained. The examination is then completed by rotating the gastroscop in all directions at progressively higher levels in the stomach until the cardia is reached.

Before going on to a discussion of the value of gastroscopy, I believe it would be well if we had clearly in mind the contraindications to and the limitations of gastroscopy. First of all, then, what are the conditions in which gastroscopy should not be used?

1. The first and most important contraindication to gastroscopy is any obstructive lesion of the esophagus or cardia. In other words, if the history, physical examination, or X-ray examination reveal evidence of such a lesion, or if obstruction is met with in the passage of the ordinary stomach tube, gastroscopy should never be attempted.

2. Aneurysm of the aorta is a definite contraindication.

3. Varices of the esophagus are usually considered contraindications, although these have sometimes been found on gastroscopy in cases where they have not been suspected; and, as far as I know, no accidents have occurred.

4. Corrosive gastritis, such as one suspects after the drinking of corrosive poisons, contraindicates gastroscopy.

5. Peritonitis or evidence of a ruptured viscus, especially in the upper abdomen, is, of course, a rigid contraindication.

6. Angina pectoris and cardiac decompensation are contraindications unless the value of the information to be obtained outweighs the danger.

7. Scoliosis and kyphosis may sometimes cause such a marked curvature in the course of the esophagus that passage of the gastroscop becomes impossible.

8. I believe it is not wise to do gastroscopy during acute respiratory infections.

9. Gastroscopy should not be forced in uncoöperative patients and should usually not be attempted in cachectic or aged patients.

10. Far advanced, obvious malignancy of the stomach usually makes gastroscopy an unwise as well as an unnecessary procedure.

In addition to the contraindications just enumerated, there are certain limitations to gastroscopy, certain types of information which should not be expected from the use of the gastroscop. These limitations are due both to the nature of the organ being examined and to the instrument being used.

1. First of all, we are limited to a view of the internal aspect of the stomach; in other words, to the inspection of the gastric mucosa. While peristaltic and respiratory movements can be seen and certain other information obtained, it must be remembered that knowledge gained concerning the deeper layers of the stomach wall is in the nature of indirect types of evidence only.

2. In addition to this, we are limited to an inspection of a comparatively small area of gastric mucosa at one time. This is in contrast to the X-ray silhouette which gives a very good picture of the general contour of the stomach.

3. There are also, in the stomach, certain so-called blind areas which are hidden from the view of the gastroscopist. I have indicated these by the shaded areas in the lower right figure of the lantern slide. They are, briefly, varying portions of the lesser curvature of the antrum and pylorus, the strip of the posterior wall on which the instrument lies, the greater curvature opposite the end of the instrument, and a small area in the fundus.

4. Furthermore, certain portions of the stomach are farther from the objective lens than others. This is especially true of the pylorus and distal part of the antrum. The picture obtained of these areas is, therefore, not always as clear-cut as we might wish.

5. The gastroscope being a closed instrument, it cannot be used to obtain biopsies. However, the taking of biopsies in the stomach through any type of endoscope will probably always be considered an unwise procedure because of the danger of hemorrhage and perforation. Furthermore, the examination of a small piece of tissue removed from a lesion in the stomach might not reveal the true nature of the lesion, give misleading information and, in some cases, lead to a false sense of security.

6. Thus far photography of the stomach through the gastroscope has not been satisfactory, so that no permanent visual record of the examination is available. We must, therefore, depend entirely on the visual acuity, experience and judgment of the gastroscopist.

The errors and failures of gastroscopy may probably be summed up in the following four points:

1. Lesions in the blind spots may be missed entirely.
2. Lesions about the pylorus, where the detail is sometimes not good, may be difficult to differentiate.
3. In doubtful cases failure to do repeated examinations will sometimes lead to false conclusions.
4. Occasionally, difficulty may be experienced in differentiating between infiltrating lesions with an intact mucosa and certain types of inflammatory lesions.

Wherein, then, does the value of gastroscopy lie? What can we expect of this type of examination which is of definite value to the patient?

Before going on with this discussion, it might be well to state here that, in experienced hands, gastroscopy is technically a relatively easy procedure, one of the easiest of all endoscopic procedures. It is distinctly an office procedure and the patient can expect to leave the office very soon after its completion. It is also a safe procedure. This is best shown by Dr. Schindler's recent report of the results of a questionnaire which he sent to all those doing any considerable number of gastroscopies. In over 22,000 cases, only one fatality was reported, and even in this case there might be some doubt as to whether or not it was the result of the gastroscopy. In addition to this, eight cases of perforation of the stomach and one of perforation of the jejunum, all non-fatal, were reported. Schiff et al¹ have recently reported an additional case of pneumoperitoneum following gastroscopy.

In general, it can be stated that gastroscopy is by far the best method of examining the gastric mucosa. Severe alterations, here seen beautifully through the gastroscope, may sometimes be overlooked by other methods, even with the best possible technic.

In general, it can also be stated that the indication for gastroscopy is any case having unexplained or incompletely explained upper abdominal symptoms. The indications for gastroscopy can probably be best elaborated further by discussing briefly the various lesions of the stomach in which the gastroscope gives valuable information.

1. *Gastritis*. The re-affirmation and the recognition of the frequency of this clinical entity is probably the outstanding contribution of gastroscopy. Its importance is brought out by

the frequency with which it is encountered in routine gastroscopies. Schindler found it present in 41.8 per cent of 1,000 consecutive gastroscopies. Gutzheit states that it is twelve times as common as gastric ulcer and three times as common as duodenal ulcer. These figures are in general agreement with those of other reports. Schindler divides his cases of chronic gastritis into three main types, namely, (a) chronic superficial gastritis, (b) chronic atrophic gastritis, and (c) chronic hypertrophic gastritis. The first two are sometimes grouped together as the superficial-atrophic group because there is some evidence to show in certain cases, at least, that the superficial type may pass over into the atrophic type; in other words, that the atrophic form is the end stage of the superficial form. There are many cases in which the evidence for this is very incomplete. Time will not permit us to more than briefly mention the chief characteristics of the gastroscopic appearance of each.

(a) *Chronic superficial gastritis*. Characteristically, there is increased redness and edema of the mucosa together with the appearance of exudation on the surface. In addition, there may be mucosal hemorrhages and superficial erosions.

(b) *Atrophic gastritis*. The mucosa appears thinned out, either diffusely or in patches. This in turn usually causes the mucosa to appear whitish or grayish or greenish-gray in patches. In these areas a network of submucosal blood vessels are more or less distinctly visible. This picture is often seen together with that of superficial gastritis. It is well to remember that gastric cancer is approximately three times as common in stomachs showing an atrophic mucosa as in stomachs not showing this abnormality. Benign polyps are also frequently seen and it is now thought that these are prone to undergo malignant degeneration.

(c) *Hypertrophic gastritis*. In this form the mucosa appears dull and lusterless, the folds become thicker and stiffer than normal and may appear ridged, while the mucosa between the folds also takes on a granular or warty or nodular appearance. There may be superficial erosions and mucosal hemorrhages.

2. *Gastric Ulcer*. Gastroscopy is of value for the following reasons:

(a) Occasionally reveals ulcers, usually shallow ones, not demonstrated by X-ray or other methods.

(b) Gives information as to whether an ulcer is benign or malignant. On gastroscopy, a benign ulcer usually appears as a sharply circumscribed lesion with a smooth, slightly elevated border which is redder than normal and a base which is smooth, glistening white, yellowish white, or grayish white and appears clean. A malignant ulcer, on the other hand, usually does not have a sharply circumscribed border, but fades into the surrounding mucosa, the border and sometimes the surrounding mucosa appears nodular, stiff and infiltrated, while the base most often appears dirty and necrotic, is reddish or brownish or grayish in color and sometimes gives a nodular appearance.

(c) Repeated observation provides the best method of following the healing of an ulcer. The direct visualization gives definite information as to when the ulcer is completely covered with epithelium.

It is fairly generally agreed that most benign gastric ulcers lie in an otherwise normal gastric mucosa. However, in a few cases gastroscopy will reveal the ulcer to be a part of a generalized gastritis which may be severe and may account for difficulty experienced in controlling symptoms.

3. *Duodenal Ulcer*. While the gastroscope does not allow direct inspection of these ulcers, it is usually well to gastroscopize these cases, in the first place, to rule out other lesions and to determine the presence or absence of an associated gastritis. Our present knowledge seems to indicate that it may be the duodenal ulcers which are accompanied by gastritis which are often refractory to treatment. It is especially important to determine the presence of gastritis if surgery is contemplated because these cases notoriously do poorly following gastric surgery.

4. *Unexplained gastrointestinal hemorrhage*. It is now generally agreed that gastroscopy is a safe procedure as soon as the bleeding has stopped and may even be used in the face of persistent bleeding if this is not too severe. Gastroscopy has revealed the following lesions where other methods have failed to find the source of the bleeding:

(a) Gastritis, especially the superficial and hypertrophic forms with or without erosions.

(b) Undiscovered gastric ulcer.

(c) Undiscovered polypic cancer.

(d) Undiscovered polyps.

(e) Other benign tumors.

5. *In certain cases of unexplained weight loss and anorexia* it is well to do gastroscopy since it is well known that many cases of gastric malignancy do not produce local symptoms until the lesion is far advanced.

6. *Preoperatively and postoperatively.* Gastroscopy has been found to be of inestimable value both before and after gastric surgery. Before surgery, it should be done to rule out other lesions than the one for which surgery is being considered and to determine the presence or absence, severity and extent of gastritis since this has been found to influence greatly the post-operative course. After surgery, gastroscopy gives information as to how well surgery has been performed, especially in regard to placement, size and function of the stoma, and frequently reveals the cause of symptoms which may be present. In a recent paper, Moersch and Walters found gastritis present in 56 per cent of one hundred cases having upper abdominal symptoms following gastric surgery.

Gastroscopy in the postoperative stomach gives rise to certain difficulties. Sometimes the remaining pouch of stomach is small and difficult to examine. In some cases the stoma is so placed that it is difficult to see with the gastroscope. In other cases normal landmarks are wiped out, making orientation difficult. In still other cases, the tip of the gastroscope may pass directly into a loop of jejunum so that one must be able to differentiate jejunal and gastric mucosa.

7. *In syphilitic patients suffering from gastrointestinal complaints,* gastroscopy will sometimes reveal the characteristic picture of syphilitic thickening and induration of the stomach wall.

8. *Carcinoma of the Stomach.* The chief value of gastroscopy here lies in the discovery of early lesions. In order to make this possible, gastroscopy should be carried out on slight provocation in those in the cancer age group. This is especially true in those cases known to have an atrophic gastritis. Many gastroscopists are now advising periodic examinations of these individuals for the purpose of picking up early malignant changes. However, one must be cautious not to precipitate cancer phobias in these people and for this reason it is probably wisest to individualize these cases in regard to this procedure.

As previously stated, gastroscopy is of definite value in differentiating benign from malignant lesions. In addition to this, it helps greatly in determining the operability of a given lesion. Schindler has recently urged the adoption of Borrmann's macroscopic classification of gastric carcinoma as an aid in determining prognosis by means of the gastroscope. He believes that our statistics of surgical cure of gastric cancer, notoriously poor at the present time, could be greatly improved by limiting surgery to those cases giving a reasonably good prognosis with this classification. While enough experience has not as yet accumulated to confirm Schindler's opinion, I believe it would be worth while reviewing briefly Borrmann's classification.

Type I. These are sharply circumscribed polypoid tumors with irregular nodes which often grow mushroom-like. They ulcerate at a late stage and often develop in an entirely atrophic mucosa. These give a good ultimate prognosis, but occur in only 2.9 per cent of all gastric cancers.

Type II. These are the sharply limited carcinomatous ulcers. The floor of the ulcer often contains necrotic material and the margins show irregular nodes which may be dark red. They are often found with an atrophic gastritis. The operative prognosis is usually excellent if the ulcer is not too large. They occur in 17.6 per cent of gastric cancers.

Type III. These are the infiltrating carcinomatous ulcers. There is a definite wall on only one side of the ulcer, the other side blending with the surrounding mucosa. The prognosis in these cases is very dubious and is distinctly bad if the

lesion is found at the pylorus. They occur in 16.2 per cent of gastric cancers.

Type IV. These are the diffusely infiltrating lesions. Unfortunately, they occur in 63.2 per cent of gastric cancers. The prognosis is so bad that Schindler believes surgery should be advised very reluctantly.

At this point, in the original presentation of the paper, a number of crayon sketches were shown which represented an attempt to illustrate some of the lesions which I have observed. They are not shown here because of difficulty in reproduction.

Figures 1, 2, 3 and 4 illustrated the appearance of a normal mucosa, chronic superficial gastritis, chronic hypertrophic gastritis and chronic atrophic gastritis respectively.

Figures 5, 6 and 7 showed different stages in the healing of a small gastric ulcer situated on the lesser curvature just above the angulus. X-ray examination showed the original ulcer crater very well, but follow-up X-ray studies were not made. However, it is very doubtful that X-ray would have shown the final epithelialization of this lesion so beautifully seen gastroscopically.

Figure 8 showed a shallow ulcer on a broad field on the lesser curvature not observed by X-ray.

Figures 9 and 10 showed a large gastric ulcer on the lesser curvature in a case seen with Dr. Horatio Sweetser who kindly allowed me to present this case. This patient, a woman, age 49, who had a history of epigastric pain for a period of five years with some weight loss, was gastroscopied on two different occasions, one month apart. At the time of the first observation the ulcer appeared fairly deep, the base was smooth, contained a small amount of necrotic-looking material, the margins were perfectly smooth, slightly elevated, reddened, and there was marked contracture of the entire lesser curvature, the pylorus being drawn up to within 1-2 cm. of the distal border of the ulcer. At this time the opinion was given that this had most of the characteristics of a benign lesion but malignancy could not be 100 per cent ruled out because of the necrotic material in the base of the ulcer. On re-examination the ulcer appeared shallower, but a little larger, the margins were still smooth, the base perfectly clean and glistening white, but one small nodule could be seen in the base. Because of the increase in size and the appearance of a nodule in the base, it was felt that malignancy had to be considered more strongly than on the first examination. However, on surgical removal the ulcer proved to be benign.

In retrospect, it is seen that if the gastroscopic criteria of a benign ulcer had been adhered to, namely, an ulcer with a clean, glistening white base and a perfectly smooth margin, the error of suggesting malignancy should not have been made.

Figure 11 showed two polyps in an atrophic mucosa which proved to be benign on surgical removal. It was seen that one appeared definitely redder and more fleshy than the other and in the gastroscopic report it was stated that this polyp presented "malignant indications" which warranted removal.

Figure 12 showed a portion of the gastroscopic appearance in a woman age 49 who showed evidence of metastatic lesions in the left lung and the brain. In searching for the primary, X-ray of the stomach had suggested only enlarged rugae in the cardiac third of the stomach with the possibility of benign polypi. However, on gastroscopic examination the characteristic appearance of a polypoid type of carcinoma was seen with two large, protruding, hemorrhagic, eroded polypoid lesions high on the lesser curvature and anterior wall and a nodular infiltration extending along the lesser curvature from the angulus to the cardia. Unfortunately, autopsy was refused in this case so that final proof of the nature of the lesion could not be obtained.

Figure 13 showed the gastroscopic appearance in a woman, age 55. She had had repeated attacks of right upper quadrant pain radiating to the back accompanied by vomiting. The pain was accompanied by jaundice on one occasion, but this cleared up. For five months the pain had become more persistent and there was a thirty-pound weight loss. One very dark stool had been passed. A cholecystogram was negative, and a gastrointestinal X-ray study was reported as negative. Biliary drain-

age produced crystals of calcium bilirubinate and cholestrin. Following this, she was about to be sent to surgery for cholecystectomy, but gastroscopy was requested. This revealed a definite carcinomatous ulcer of the lesser curvature just above the angulus with a shallow, dirty, reddish and grayish crater and a nodular infiltrating border. X-ray study was then repeated and now a shallow, irregular ulcer of the lesser curvature was found which was interpreted as being malignant. On going over the original films I think we can see a persistent stiffening out of a small portion of the lesser curvature. Surgical removal confirmed the diagnosis, the pathological report being an ulcerating adenocarcinoma.

Figure 14 showed a smooth, flat, non-ulcerating polypoid growth seen in a 44 year old woman who had had repeated, severe gastrointestinal hemorrhages for a period of one year. X-ray studies had been repeatedly negative except for a slight deformity of the duodenal cap which, it was thought, could possibly indicate a small ulcer. The growth was removed surgically and proved to be a benign leiomyoma. In this case also, in retrospect, I think we can see on the X-ray films a slight irregularity of the rugae high in the fundus of the stomach.

In conclusion, let me repeat that gastroscopy does not replace any of our other gastrointestinal diagnostic equipment. However, I think we have come to the stage where we can definitely state that gastroscopy is a very valuable and, in some cases, a greatly needed adjunct to our present diagnostic armamentarium.

DISCUSSION

Dr. JAY C. DAVIS: I have enjoyed Dr. Ylvisaker's paper a great deal because of the conservative manner in which he has presented it. Only a few years ago pathologists in our locality were denying the existence of gastritis. The European clinicians were ahead of us in recognizing various types of gastritis. Even before the advent of the gastroscope, some idea of gastritis had been secured by the fixation of the stomach with formalin immediately after death. The development and use of the gastroscope has meant a great advance in our knowledge of gastritis. It has been interesting to me how many people with symptoms of gastritis are reported negative on X-ray; and also that some of these people months or years later, on repeated X-ray, would be reported as having a small ulcer in the mucous membrane which on gastroscopy would prove to be a superficial ulceration of the membrane and not a true peptic ulcer. It has also been my experience that after several years of gastritis some of these people develop duodenitis and duodenal ulcer. Dr. Ylvisaker has stressed the fact that X-ray and gastroscopy supplement each other and that both must be done.

Another advantage of the gastroscope in the hands of men who know what they are looking at in the stomach, is the ability to save many people from exploratory operations, due to the fact that the gastroscopist can often differentiate between the malignant and non-malignant lesions of the stomach and thus save the person from being opened up needlessly. Because of the anesthetizing of the throat, patients often state that it was easier for them to have the gastroscope passed than it is to swallow a duodenal tube.

Dr. DOUGLAS HEAD: I would like to ask Dr. Ylvisaker how he feels about the relative value of the gastroscope as compared with the X-ray; and whether any hemorrhages have resulted from passing the gastroscope or any esophagitis that is difficult to clear up.

Dr. RUSSELL MORSE: I wish to congratulate Dr. Ylvisaker. Tonight we have really seen gastroscopy in Minneapolis leave its swaddling clothes. Heretofore we have had pictures by Schindler, tonight we have had very artistic drawings by Dr. Ylvisaker and they are perfectly descriptive.

The roentgenologists have been very much interested in gastroscopy because for many years we have been interested in

gastritis. We have been very pleased to find that there is not a great deal of difference in the gastroscopic and roentgenographic findings. We all miss some things, the gastroscopists can see some things better than we can and we can see some things better than they can. In discussing the great majority of cases we still suffer a little bit from the difference in our terminology; we are talking about the same findings but using different words. Dr. Ylvisaker and myself have been able to reach a common accord, but in the terms we use in describing gastritis we need some clarification before we completely understand each other.

Where we have seen gastroscopy used it has been a very simple procedure of no great discomfort to the patient. I have had the opportunity to see many gastroscopic examinations and I would like to see more just to cross-check myself as far as diagnosis is concerned. I would urge you to use gastroscopy both for diagnosis and for differential diagnosis of lesions known to be present by other methods of examination.

Dr. C. N. BORMAN: I had the opportunity of fluoroscopic examination of the patients discussed on three different occasions. At first we felt that this was probably a benign ulcer, that is, we leaned that way. There was an extensive inflammatory induration of the gastrohepatic ligament, and the resulting deformity of the lower third of the stomach was so marked that it was under extreme difficulty that the fluoroscopic examination was done. Likewise there was great difficulty in arriving at a decision as to benignancy or malignancy from the films. We did lean toward benignancy, however, because the lesion was penetrating rather than invaginating, central rather than eccentric, and because we did not feel that there was any great disproportion between the size of the ulcer and the zone of the induration. The presence of the extensive inflammatory changes with resulting deformity of the stomach was as great a factor in influencing us toward benignancy as was the appearance of the ulcer itself. The gross examination of the excised specimen was of considerable interest. There was a definite elevation at the periphery of the ulcer, but it felt soft rather than hard, and there did not appear to be any nodular elevation. There was an extreme contraction of the lesser curvature of the stomach and the difficulty encountered in fluoroscopic examination could be well explained after examining the gross specimen. The opinion of the pathologist was interesting. From looking at the outside of the excised specimen he felt that the chances were nine to one for malignancy. This was because of the attachment of the mesentery to the base of the ulcer, the presence of pearly nodules at the base of the ulcer, and because of the size and hardness of the peripheral lymph nodes. However, when he viewed the specimen from the inside he would not venture an opinion one way or another as to the question of malignancy. After repeated microscopic sections failed to demonstrate malignancy, it was the opinion of the pathologist that the predominating point favoring benignancy was the fact that the edge of the ulcer was not particularly large.

Dr. MALCOLM HANSON: I think this is a very excellent presentation of this subject. I do not think there should be any disagreement between the roentgenologists and the gastroscopists because of the value of their examinations. Any time we can add something to our diagnostic acumen we should certainly take advantage of it.

Dr. R. S. YLVISAKER: I appreciate the discussions and the comments that have been made. I think the only question was the one brought up by Dr. Head in regard to hemorrhage and esophagitis. I have not run into any trouble with that. We do see slight injuries of the gastric mucosa, slight superficial hemorrhages, but I have as yet to encounter any hemorrhage of any size or severity at all.

I have had no experience with esophagitis. None of the patients I have seen have had any complaint that would indicate this. Some have slight sore throats for one or two days but that is all.

OBSTETRICAL ANALGESIA

OWEN F. ROBBINS, M.D.

MINNEAPOLIS

(Inaugural Paper)

Most men in the obstetrical field now feel that analgesia and amnesia in labor are necessary to refined obstetrics. They have been forced to accept this idea partly because of pressure from their patients who, from their reading in lay periodicals, are convinced that childbirth should be a painless procedure; and partly because they themselves feel there are definite benefits to be derived from analgesia and amnesia during labor. Bishop says that "the morale of the patient is controlled so that early radical meddling interference with its trail of morbidity and mortality to the mother is obviated." Pomeroy states that "analgesia will convert an undamaged and unterrified primipara into a competent multipara."

The dangers of obstetrical analgesia are well known. Dr. Hellman at Johns Hopkins, in a recent review of obstetrical analgesia for the last ten years, makes this statement: "That the relief of pain in labor in itself is a worthy end cannot be doubted; however, if the price in the wellbeing of the newborn infant is too high, then the pain must remain unrelieved."

Cole, Kimball and Daniels show very definitely that, with the increase in the dose of analgesic, there is a corresponding increase in the degree of asphyxia in the baby. Montgomery states that "the supervision of the case is transformed from an intelligent conduct of labor into the treatment of drug confusion and one doubts that the effect is worth the reaction it produces." He further states that the incidence of operative delivery is increased, that birth trauma is greater, and that there is an increase in the blood loss.

It is my opinion, from my reading on the subject of obstetrical analgesia referring specifically to the barbiturates, that one might conclude that smaller doses could be used with comparative safety. This is well shown by Cole et al. If one could keep the dosage down to safe levels many of the complications and untoward results from the various barbiturates would be avoided. My impression has been, although it is not confirmed, that there is a great deal of deviation in an individual's susceptibility to the different barbiturates. This opinion is based on the observation of patients in labor and patients who are receiving hypnotics for other reasons. It is common medical practice to change to another barbiturate where one is found to be not well tolerated or ineffective, and to find the second one very much superior to the first.

Idiosyncrasies to drugs are encountered in all fields of medical practice and the same is true in the barbiturates used for obstetrical analgesia and analgesia. Cutaneous manifestations from idiosyncrasies to these drugs were reported almost from the time of their introduction. Langenback found that persons allergic to sodium amylal experienced the same symptoms following the use of plain amylal. However, they could take luminal without discomfort. This is interesting as showing how an extremely slight change in the formula of the drug may alter its allergenic specificity.

About two years ago we became interested in the fact that the matter of safe dosage in obstetrical analgesia was of the utmost importance with regard to the safety of the mother and baby. If one could find the barbiturate which acted the most efficaciously, a safe dosage could then be used with maximum effect. In addition to this, it seemed important to know whether the barbiturate was safe to use in labor and if idiosyncrasies existed. With this in mind, a method was evolved for the testing of patients before their labors with certain of the commonly used barbiturates. A chart was constructed, with the drugs listed in one column. They were as follows:

1. Seconal (sodium propyl-methyl-carbinyl-allyl barbiturate).
2. Nembutal (sodium ethyl 1 methyl butyl pentobarbital).
3. Sodium Amytal (sodium iso-amyl-ethyl barbiturate).
4. Sodium Pentobarbital.
5. Combination of Seconal and Sodium Amytal.

All these in equivalent dosage.

The patients were advised to take each capsule, usually every other evening, about two hours after the evening meal. In the

second column they were to record the time when the effect of the capsule was first noticed. A half hour after the effect became apparent, they were asked to test themselves with regard to their ability to write, read and converse. They then went to bed, and the type of sleep was recorded. If there was any after-effect ("hang-over") the following day, this was recorded on the chart.

In this way an attempt was made to discover how rapidly the drug acted and how long the effect lasted. Also, by recording their abilities to read, write and converse, the patients gave evidence as to how profound the effect was. If a patient was restless during the night, this was considered to indicate there might be some excitement if the drug were used during labor.

One hundred forty-eight patients were tested in this way during their prenatal period and the results of their labors analyzed insofar as their analgesic and amnesic responses were concerned. These patients were not selected in any way but were taken consecutively as they presented themselves for care. The majority were primigravida (66 per cent), and all were very intelligent and cooperative.

It is interesting to note the results of the tests. One hundred twenty-eight were able to pick one capsule which seemed to react most effectively. Some of these patients found that other capsules were also effective but that the one picked was the best of the group tested. There were seventeen additional patients who were unable to tell any difference in their reactions to the various capsules. Seconal seemed to be the most popular, sixty-three patients having picked it as being the best. The combination capsule was next, with thirty-five patients judging it to react the most favorably. Eighteen patients selected nembutal, and fourteen the sodium amylal. Only one patient decided on sodium pentobarbital. While nembutal and sodium pentobarbital have the same chemical structure, clinically they react somewhat differently. Very few patients made favorable comment to the sodium pentobarbital and only one, as stated, picked it as the best.

Ten patients noticed ill effects from taking the capsules. Two reacted unfavorably to nembutal; one developed a severe headache and the other a rash. This latter patient also noticed a rash after taking the sodium pentobarbital. Seconal was ruled out in one patient because of marked nausea, and in two patients there was excitement. Four patients decided against sodium amylal because of tachycardia, diarrhea, an asthmatic attack, and itching of the hands and urticaria. The latter two patients had urticaria and an asthmatic attack from the combination capsule.

Technic of Administering the Analgesic during Labor. As soon as the patient began to complain of her pains and was definitely in labor, the analgesia was started. Two of the capsules of the chosen barbiturate were given with scopolamin gr. 1/200. If the response to the medication did not seem sufficient in one-half hour, another capsule was given and, if necessary, scopolamin gr. 1/300. The capsule was repeated in another half hour depending on the reaction of the patient. If the patient vomited the capsules they were repeated by rectum. Only liquids were given to the patients in labor and, whenever possible, a nurse was in constant attendance. The barbiturate capsules rarely exceeded four in number, and 1/120 gr. of scopolamin was the absolute maximum.

Notes were kept as to the patient's reactions, as to how complete the analgesia seemed to be, the effect on uterine contractions, and ability of the patient to cooperate, the blood loss, and the resuscitation of the baby.

Seconal was used in labor 67 times, the combination capsule 36 times, sodium amylal 14 times, and nembutal in 19 cases. There were only sixty-three patients who actually picked seconal, but the difference in the number who had seconal in labor and the number who picked it was because seconal was elected by me in some of the undecided cases.

Length of Labor. The average length of labor for the whole group was 7.4 hours. The patients who received seconal had an average labor length of 6 hours. This was from the time the patient was definitely judged to be in labor until delivery. The patients who received the combination capsule had an average labor length of 8.8 hours; the nembutal patients labored 7.7 hours; those with sodium amylal, 7.3 hours.

In seven patients there was a definite slowing of the labor pains after the institution of the drugs. Two of these patients received nembutal; three the combination capsule; and two seconal.

In all of the other patients it was thought that the relaxation incident to the exhibition of the drug had a definite beneficial effect on the contractions and that, if anything, the labor was more rapid.

Dosage. The dosage of the drugs used in labor was as follows:

Of the 67 patients who received seconal, 32 had only 2 capsules, 27 received 3 capsules, 8 received 4 capsules.

Of the 35 patients who received the combination capsule, 15 were given 2 capsules, 15 were given 3 capsules, 5 were given 4 capsules.

Of the 19 patients receiving nembutal, 5 were given 2 capsules, 14 were given 3 capsules.

Of the 14 patients receiving sodium amytal, 7 were given 2 capsules, 7 were given 3 capsules.

One hundred and twelve (112) patients were given scopolamine — 91 received 1/200 gr., 21 received 1/120 gr.

Three (3) patients received morphine because of excitement — 2 were given 1/6 gr., 1 was given 1/8 gr.

In summary, 59 patients received 2 units of the barbiturates, 63 patients received 3 units, and 13 patients received 4 units.

Response to the Drug. In judging the response of the patient to the drug, the amount of excitement and the ability of the patient to cooperate was taken into consideration. Generally speaking, the more the excitement the better the amnesia and analgesia, but this was not necessarily so. All patients were excited to a certain extent but there were various degrees.

In 38 patients there was *marked excitement*—16 of these were given seconal, 11 received the combination capsule, 4 received sodium amytal, 7 received nembutal.

In 59 patients there was *moderate excitement*—31 of these received seconal, 15 received the combination capsule, 5 received sodium amytal, 8 received nembutal.

There were 38 patients who experienced *mild excitement*—20 of these were given seconal, 9 were given the combination capsule, 5 were given sodium amytal, 4 were given nembutal.

In 92 patients *coöperation* was considered *good* — 49 of these received seconal in their labor, 22 received the combination capsule, 9 received sodium amytal, 12 received nembutal.

In 43 patients *coöperation* was considered *poor* — 18 of these had been given seconal, 13 received the combination capsule, 5 received sodium amytal, 7 received nembutal.

The results of amnesia and analgesia was decided upon by asking the patient what she remembered of the events of her labor and of the pain. Amnesia and analgesia was considered complete if there was a total loss of memory regarding the labor after the medication was started. It was considered partial if there were islands of memory, and poor if the patient could remember most of the labor. The patients were questioned one or two days after their delivery. The results are probably better by this method of questioning later, but the important thing is what the patient remembers of her labor.

In 92 patients, the *analgesia and amnesia* were considered to be *complete*—48 of these had received seconal, 28 received the combination capsule, 6 received sodium amytal, 10 received nembutal.

In 40 of the patients, *analgesia and amnesia* was considered *partial*—17 of these had received seconal, 7 received the combination capsule, 7 received sodium amytal, 9 received nembutal.

In 3 patients, *analgesia and amnesia* was considered *poor*—2 of these received seconal, 1 received sodium amytal.

The final result is, then, that 73 per cent of the patients had complete analgesia and amnesia; 25 per cent had partial, and 2 per cent had poor results with their medication.

Labor was terminated in the following manner:

105 patients were given the benefit of *outlet forceps*—51 of these patients received seconal, 30 received the combination capsule, 9 received sodium amytal, 15 received nembutal.

24 of the patients *delivered spontaneously*—13 of these received seconal, 3 received the combination capsule, 2 received sodium amytal, 4 received nembutal.

There were 6 *breeches*—2 of those were given seconal, 2 were given amytal, 1 received the combination capsule, 1 received nembutal.

In explaining the high incidence of outlet forceps, it has been my technic to use simple outlet forceps when the head had begun to crown. My belief is that the head can be controlled more accurately and that an episiotomy can be done with the patient more completely asleep if forceps are used to extend the head. The morbidity to the mother and child is no greater with outlet forceps. In many of these patients the delivery would have been spontaneous, and in those where delivery was spontaneous it was because there was not time to apply forceps.

One hundred twenty-three (123) of the babies *breathed immediately* without resorting to any type of resuscitation. In five (4 per cent) *resuscitation* to a *mild degree* (not as far as contrast tubs) was necessary—

3 of the mothers had been given seconal in labor, 1 mother was given nembutal, 1 mother was given the combination capsule.

Two of the babies (1.6 per cent) had a *profound asphyxia*—1 mother had received the combination capsule, 1 mother had received nembutal. The baby whose mother received nembutal was definitely premature and died a neonatal death 12 hours later.

There were 5 *stillbirths* in the series—2 of these mothers received seconal, 1 was a persistent occiput posterior delivered by outlet forceps, was normal at birth, but refused to breathe. 1 was an antepartum death.

1 mother received sodium amytal and delivered stillborn twins; 1 twin died antepartum and the other intrapartum. Autopsy of the twins showed congenital abnormalities.

1 mother received nembutal; the baby was quite premature and did not attempt to breathe.

No accurate figures were kept as far as blood loss was concerned because of the lack of apparatus, but generally the blood loss seemed to be within normal limits and on only three occasions was it alarming enough to require special measures. Packing was not required in any instance. It is my general impression that the anesthetic had more to do with blood loss than the analgesic drugs. Of the three patients who had an excessive blood loss, two received seconal and one received the combination capsule.

A comparison with results of others would lead one to believe that the number of patients who stated they had complete amnesia in this series is comparable favorably to the number in other series.

Hedges, reporting 786 deliveries, stated that 75 per cent had complete amnesia, 14 per cent of the babies required resuscitation. Six grains of sodium amytal and 6 grains of seconal were used in combination with scopolamin gr. 1/150. The scopolamin gr. 1/200 was repeated as often as necessary.

Kane and Roth, reporting 611 cases, stated that analgesia and amnesia was good in 57 per cent, partial in 28 per cent, no relief in 7.7 per cent. Four and seven-tenths per cent of the patients remembered events but no pain; 2.6 per cent remembered some pain.

Conn and Vant reported 92 per cent had good analgesia and amnesia, 5 per cent fair, and 3 per cent poor. They used nembutal gr. 6 and paraldehyde drams 4 as an initial dose and 1½ gr. of nembutal was given as needed.

Santos and Dickens used 9 to 12 gr. of sodium amytal orally

and repeated 3 to 6 gr. every three to four hours. Scopolamine gr. 1/150 was used as an initial dose and was repeated when necessary. Seventy-five per cent of the patients obtained complete amnesia, 15 per cent partial amnesia, and there were 10 per cent failures. Twenty per cent of the patients were so excited that they had to be restrained. Seventy per cent of the babies breathed normally.

Clifford and Irving, working with nembital and scopolamine, report complete amnesia in 78 per cent, and 3 per cent of the babies required resuscitation.

SUMMARY

My aim has been to present a method whereby an analgesic can be given in moderate and safe doses and still obtain an effect comparable to the effects reported in the literature where much larger doses were used. It is true that the patients are testing themselves under conditions which are not the same as during labor, but nevertheless it is my conviction that by this method one can ascertain which particular barbiturate is the most effective for that particular patient. There is no doubt that the method has some psychological effect on the patient and she goes into her labor with the knowledge that she is going to receive something for her pain. This may, in some way, account for the good results obtained with the small dosage.

Seventy-three per cent of the patients made the statement that they had no recollection of their labors. Twenty-five per cent could remember certain events which happened but had no definite recollection of pain, and 2 per cent had no results from the medication.

These results were obtained with a dosage which was a great deal less than that usually given and which resulted in only two babies (1.35 per cent) which had profound asphyxia. Five of the babies required mild resuscitation. There was only one child in the series in which the cause of death might have been attributed to the analgesia; this is not likely, however, as the child symptomatically resembled a head injury. Unfortunately, we were unable to obtain an autopsy. The other stillbirths were premature and antepartum deaths.

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DISCUSSION

Dr. R. T. LAVAKE: This is a most intelligent and logical approach to this subject.

I have used barbiturates to alleviate the pain of labor ever since they came out, confining myself chiefly to nembital; and I have never seen one serious untoward effect upon the mother, and in only one instance have I had any difficulty with a child that I thought might be attributed to the drug. And in this instance the drug may not have been the cause of the troublesome asphyxia. In my opinion, difficulties with mother and child recorded in literature have been due to too large dosage. Dr. Robbins has rightly emphasized the successful use of small amounts of various barbiturates and scopolamine. My experience accords with his. An initial dose of 1½ grs. for every hundred pounds of body weight or fraction thereof is sufficient.

Following this initial dose, it has seemed to me that it is better to repeat grs. 1½ after every twenty pains than to repeat medication at stated hours. This method has the following merits: the doses gear with frequency of pains; it necessitates careful watching to count the pains and these patients should be continuously supervised. In my experience, amnesia is more complete in a higher percentage of cases if scopolamine is used. Under such a regime, it is very unusual to have to give more than 6 grains of nembital before reaching the stage when nitrous oxide and ether may be used.

That satisfactory analgesia and amnesia can be obtained in a high percentage of cases without danger to mother and child, I am convinced.

Dr. Robbins has given us a most excellent paper.

Dr. C. J. EHRENBURG: I can remember when Dr. Robbins started this work and I was rather skeptical as to the specificity of these various barbiturates. I think he has demonstrated that there is something to the specificity. I have used nembital and more recently cyclopal in two unit doses combined with gr. 1/150 scopolamine and although the results have been generally good, I do not think they approximate Dr. Robbins's. One is impressed by the low dosage therapy efficiency that he has shown in comparison with the higher dosage of other authors. Dr. Cole's work presented here two years ago, in which he objectively analyzed 5,000 cases purely from the standpoint of the pediatricist shows definitely the increasing danger to the baby as the dosage of sedation is increased.

I hope Dr. Robbins goes on with this work. In addition to extending the observations to other barbiturates, it would be interesting to include placebos as I am convinced that obstetrical analgesia is greatly dependent on individual temperament of the patient. Confidence, desire for a baby, and many other factors influence the reaction to pain.

Dr. ROY E. SWANSON: Dr. Robbins's paper was both interesting and instructive. He prefers seconal and his figures seem to support this.

The number of cases, of course, is too small to draw any definite conclusion. There is no question that the selection of the drug, its dosage and the time given are important factors in pain relief. Dr. Robbins uses scopolamine almost routinely. This adds much to the effect of the barbiturates, but adds to the risk, in my opinion. I have tried all of the barbiturates that he mentions and I invariably come back to nembital without morphine or scopolamine. A drug to be satisfactory in labor should alleviate pain, not delay the progress of labor and have no ill effects on the baby. I do not think we have found such a drug as yet.

Dr. R. T. LAVAKE: I would like to ask Dr. Robbins if he can count more accurately on the patient's late statement as to pain in labor than upon an early statement. It seems to me that women react to their experience in labor much as men react to their experience in battle. Again and again I have witnessed what seemed to be failures in analgesia and amnesia only to have the patient later say that she didn't mind it at all; and on the contrary, I have had patients tell their husbands right after an apparently easy labor that it was nothing at all, and a few days later they will say that it was frightful and that they had never experienced anything so terrible. They are like the men who tell gruesome tales of their experience in battle when, as a matter of fact, they had a comparatively easy and safe time of it.

As regards asphyxia in babies, my experience has led me to believe that we frequently assign a wrong cause to severe asphyxia. It has so happened that many of my fatal cases have followed easy, rapid, term deliveries, in which time did not allow the administration of barbiturates. Autopsies usually revealed cerebral hemorrhage, likely from too rapid molding. Where no cause was revealed, had analgesics been used, they would likely have been blamed for the results. In most instances, had analgesics been used and no autopsy performed, the analgesic would have been blamed. On the other hand, again and again, believing that delivery was a long way off and deeming a good rest necessary for the patient, I have given ¼ gr. of morphine only to have the patient deliver within the hour and yet with absolutely no asphyxia or delayed breathing in the child.

Except when huge dosage has been used, I am inclined to believe that serious asphyxia is generally due to causes other than the drug.

Dr. CHARLES H. MCKENZIE: I have enjoyed this paper very much. I think that the psychological approach that Dr. Robbins has undertaken is very important in his analgesia because it gives the patient a feeling of confidence and a knowledge that she will receive relief during labor.

I note that he uses scopolamine with seconal. Scopolamine is an excellent amnesic and by itself apparently has no effect on the respiratory system of the baby. I used it in the country for 25 cases, and did not note any bad effects on the baby. In fact, all the babies breathed and cried immediately, but the problem of restraint for the patient during labor forced me to discontinue it as a method of analgesia and amnesia. Seconal too seems to have little effect on the respiratory system of the baby.

The most severe pains are those of the end of the first stage of labor, and one hesitates at this time to give any analgesia because of the possible effect on the baby. However, I have used seconal in doses to 3 grains, given at the end of the first stage and have not noted any depression of respiration in babies born within the next two hours.

I agree with Dr. Robbins in his almost routine use of low or outlet forceps, but I think the use of forceps should be limited to those who know how to use them. After all, the most important part of analgesia in labor comes from the confidence of the patient in her obstetrician, and Dr. Robbins's psychological approach in assuring his patients that they will receive relief is greatly to be commended.

DR. OWEN F. ROBBINS: I would like to thank you gentlemen for your kind discussions. I realize that this is a very small series and I did not attempt to decide on any one particular drug as being the best. I hope the drug firms won't assume that their particular preparation is what I thought to be the most valuable one. I intend, however, to continue with this study.

I did use gas during the second stage in all of these cases. The analgesic was started when the patient first began to complain of pain regardless of the dilatation of the cervix. The patient was asked to state when she felt the analgesic was necessary. Patients have to be watched while in labor and while under the influence of these analgesic drugs. All the patients in this study were carefully supervised by a nurse who was in constant attendance. Giving patients solid food while in labor is dangerous because of the effect of the barbiturates on the cough reflex. I think there is some natural amnesia in patients who have had no drugs at all. The pain is forgotten very rapidly. I do not know how else we can judge the amnesia or analgesic results except by the patient's own statements.

ERNEST R. ANDERSON, M.D., *Secretary.*

News Items

The Woman's Auxiliary to the South Dakota State Medical Association held its annual meeting in Mitchell, May 18-20. A luncheon was held at the Widman Hotel followed by a business meeting at which time the following officers were elected: President, Mrs. F. C. Nilsson, Sioux Falls; president-elect, Mrs. B. M. Hart, Onida; first vice-president, Mrs. D. R. Mabee, Mitchell; second vice-president, Mrs. G. E. Whitson, Madison; recording secretary, Mrs. J. C. Hagin, Miller; corresponding secretary and treasurer, Mrs. Otto Hansen, Valley Springs. A report of the philanthropic project, the Benevolent Fund, was given by Mrs. F. C. Nilsson. A message from the Medical Association was given to the Auxiliary by Dr. B. M. Hart, president of the South Dakota State Medical association.

Dr. Mario Fischer, Duluth city health officer, was re-elected president of the St. Louis County Tuberculosis and Health association at the annual meeting held recently.

The North Dakota Academy of Ophthalmology and Otolaryngology met in twenty-third annual session in Grand Forks, May 20, with Nelson A. Youngs, M.D., Grand Forks, presiding. Members and guests enjoyed a luncheon at the Ryan Hotel after which Dr. K. M. Simonton of the Mayo Clinic addressed the group on the subject, "The Symptom of Dizziness; Its Significance in General Practice." Case reports were presented by A. D. McCannell, M.D., Minot; George Foster, M.D., Fargo, and G. A. Larson, M.D., of Fargo. At the business session a new constitution was adopted and the following officers were elected: President, A. E. Spear, M.D., Dickinson; vice-president, L. G. Smith, M.D., Mandan; secretary-treasurer, F. L. Wicks, M.D., Valley City; members of the council, Geo. M. Constans, M.D., Bismarck; A. D. McCannell, M.D., Minot, and Rolfe Tainter, M.D., Fargo. Dr. M. B. Ruud, Grand Forks, acted as chairman of the committee on arrangements for the meeting and introduced Dr. Simonton.

New officers of the seventh district medical auxiliary (South Dakota) are as follows: President, Mrs. Anton Hyden; Vice president, Mrs. Peter Ver Meulen; Secretary, Mrs. H. R. Hummer; Treasurer, Mrs. J. A. Kittleson.

Approximately 40 children from counties in the southeastern part of South Dakota attended the crippled children's semi-annual clinic held recently in Mitchell. The clinic was in charge of Dr. Guy E. Vandermark of Sioux Falls.

Dr. W. F. Cogswell, secretary of the Montana state board of health, represented Montana at the meeting called by the United States public health service at Washington, D. C., the week of April 28.

Four Montana physicians were recently appointed to carry on the N.Y.A. health program in the southern and eastern parts of that state. They are: Drs. R. D. Harper, Sidney; E. M. Adams, Red Lodge; B. C. Farland, Jordan; and C. F. Hogeboom, Baker.

Dr. T. W. Collinson was recently appointed city health officer of Scobey, Montana.

Dr. J. Vincent Sherwood, Sanator, vice president of the South Dakota Tuberculosis association was re-elected to the board of directors of that association at the meeting held in Madison in April.

Dr. M. M. Heffron, Fargo, North Dakota, who was affiliated with the Dickinson Clinic for the past seven years, is now with the Roan and Strauss Clinic at Bismarck.

Dr. C. J. Watson, Minneapolis, and Dr. A. R. Barnes, Rochester, Minnesota, were among 11 new members admitted May 8 by the Association of American Physicians which has a membership limited to 125 of the nation's outstanding medical scientists. The association, meeting in Atlantic City, New Jersey, named Dr. James Howard Means of Harvard university, president.

Dr. A. L. Gleason, Great Falls, Montana, attended the western regional meeting of the American Academy of Pediatrics in San Francisco May 4.

Dr. Charles A. Arneson, Bismarck (North Dakota) physician studying at the University of Pennsylvania graduate school of medicine, has been called to active duty as a first lieutenant in the United States army medical corps.

The members of the city health department of Missoula, Montana, are continuing their annual summer roundup of pre-school-age children with examinations to be concluded the week of June 23. Hundreds of children are being examined. If any defects are found, the case is referred to the family physician for correction before the child enters school.

Dr. Louis T. O'Brien, Wahpeton, North Dakota, has been called into active duty with the United States Army.

Dr. J. C. Swanson, Fargo orthopedic surgeon, was recently honored by the medical profession of Williston at a dinner. He was in charge of the annual Elks crippled children's clinic which was held at the Elks home in Williston. The clinic was sponsored jointly by the state and county welfare boards and the B. P. O. Elks of Williston.

Cancer control in North Dakota was discussed by Dr. L. W. Larson, Bismarck, and X-ray and radium treatment by Dr. H. M. Berg at the quarterly meeting of the sixth district medical society of the North Dakota State Medical association. Case reports were also presented.

Dr. H. W. K. Zellhoefer, Sioux Falls, South Dakota, a major in the Organized Reserves, is now in Camp Leonard Wood, Missouri, with the medical corps of the United States Army.

Dr. E. G. Vinje, formerly of Hebron, North Dakota, has taken over the practice of his brother, Dr. Ralph Vinje, in Beulah, who has been called to service in the United States Army.

The next examination for appointments as Assistant Surgeon, U. S. Navy, (Lieutenant [junior grade], Medical Corps, U. S. Navy), will be held at all major Naval Medical Department activities on August 11 to 15, inclusive. Applications for this examination must be in the Bureau of Medicine and Surgery not later than July 15, 1941. Applicants for appointment as Assistant Surgeon must be citizens of the United States, more than twenty-one (21) but less than thirty-two (32) years of age at the time of acceptance of appointment, and graduates of a class "A" medical school who have completed at least one year of intern training in a hospital accredited for intern training by the council on Medical Education and Hospitals of the American Medical Association. A circular of information listing physical and other requirements for appointment, subjects in which applicants are examined, application forms and other data pertaining to salary, allowances, etc., may be obtained from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., upon request.

Dr. R. J. Wilkowske has opened an office in Owatonna, Minnesota.

Dr. Allen E. Magnuson, a graduate of the University of Minnesota Medical School who was associated with Oliver Clinic at Graceville for the past two years, has opened an office in Wheaton, Minnesota.

Dr. Charles F. Rosenberg, Shakopee, has taken over the practice of Dr. Herbert Boysen in Welcome, Minnesota.

Dr. A. R. Gilsdorf, Dickinson, North Dakota, has joined the United States Army as a first lieutenant in the medical corps.

The Graduate Fortnight of The New York Academy of Medicine will be held from October 13 to 24, 1941. The purpose of the Fortnight is to make a complete and authoritative presentation of a subject of outstanding importance in the practice of medicine and surgery. The subject this year is "Cardiovascular Diseases Including Hypertension." The Fortnight will present a program which will include morning panel discussions, afternoon clinics and clinical demonstrations at hospitals of New York City, evening addresses, and a scientific exhibit. The evening sessions at the Academy will be addressed by recognized authorities from leading medical centers of the United States and Canada. The comprehensive exhibit will include books and roentgenograms; pathological and research material; clinical, laboratory, diagnostic and therapeutic methods. There will be demonstrations of exhibits and of fresh pathology. A complete program and registration blank may be secured by addressing Dr. Mahlon Ashford, The New York Academy of Medicine, 2 East 103 Street, New York.


Directory of Medical Specialists

A second edition of the *Directory of Medical Specialists* has been authorized by the Advisory Board for Medical Specialties, to be ready for distribution in February, 1942, with its contents complete to January 1. This Directory is the official publication of the Advisory Board, and will list the names of approximately 18,000 diplomates of the fifteen American Boards examining candidates for certification in the specialties. This is an increase of 4,000 over the first edition issued early in 1940.

The geographic grouping will give completely revised biographic data about each diplomate; there is an alphabetic index with addresses and specialty designations; and the plan of organization, officers, and examination requirements of each American Board are fully outlined in their various sections.

The biographic data of diplomates will not only be revised to date, but also will include much new information not found in the first edition. Details of formal training is one of these, and military appointments now held is another.

Only those who have been formally certified by one of the American Boards can have their names included, and all of these are included, there being no charge or obligation other than certification for such listings.



Minneapolis, Minnesota
July, 1941

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New Series

Transactions of the South Dakota State Medical Association

Sixtieth Annual Session
Mitchell, South Dakota
May 18, 19, 20, 1941

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ALTERNATE DELEGATE TO A. M. A.	
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2. N. J. NESSA, M.D.	Sioux Falls
3. C. E. SHERWOOD, M.D.	Madison
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1. B. M. HART, M.D.	Onida
2. N. J. NESSA, M.D.	Sioux Falls
The Council	
PUBLICATIONS	
Sec. 4.	
C. E. SHERWOOD, M.D.	Madison
The Council	
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1. F. D. GILLIS, M.D. (1942)	Mitchell
2. L. J. PANKOW, M.D. (1943)	Sioux Falls
3. W. H. SAXTON, M.D. (1944)	Huron

MEDICAL EDUCATION AND HOSPITALS

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| 1. N. J. NESSA, M.D. (1942) | Sioux Falls |
| 2. F. J. TOBIN, M.D. (1943) | Mitchell |
| 3. T. P. RANNEY, M.D. (1944) | Aberdeen |

MEDICAL ECONOMICS

- | | |
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| 1. T. F. RIGGS, M.D. (1942) | Pierre |
| 2. G. I. W. COTTAM, M.D. (1943) | Sioux Falls |
| 3. HAROLD MILLER, M.D. (1944) | Brookings |

PUBLIC HEALTH

- | | |
|----------------------|---------|
| D. S. BAUGHMAN, M.D. | Madison |
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Sub-Committee on Cancer

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| 1. J. C. OHLMACHER, M.D. | Vermillion |
| 2. M. C. JORGENSEN, M.D. (1942) | Watertown |
| 3. T. J. BILLION, M.D. (1943) | Sioux Falls |
| 4. JOHN L. CALENE, M.D. (1944) | Aberdeen |

Sub-Committee on Tuberculosis

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| 2. E. W. JONES, M.D. (1943) | Mitchell |
| 3. R. E. JERNSTROM, M.D. (1944) | Rapid City |

Sub-Committee on Mental Hygiene and Child Welfare

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| 2. F. W. HAAS, M.D. (1943) | Yankton |
| 3. A. TRIOLO, M.D. (1944) | Pierre |

*Sub-Committee on Syphilis Control Program,
U. S. P. H. Service*

- | | |
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| 1. ANTON HYDEN, M.D. (1942) | Sioux Falls |
| 2. G. J. VAN HEUVELEN, M.D. (1943) | Pierre |
| 3. FRED P. BESTGEN, M.D. (1944) | Rapid City |

NECROLOGY

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| 2. J. V. MCGREEVY, M.D. (1943) | Mitchell |
| 3. R. V. OVERTON, M.D. (1944) | Winner |

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| 2. S. M. HOHF, M.D. | Yankton |
| 3. R. E. JERNSTROM, M.D. | Rapid City |
| 4. PAUL G. BUNKER, M.D. | Aberdeen |

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| 6. O. J. MABEE, M.D. | Mitchell |
| 7. J. F. D. COOK, M.D. | Pierre |

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| 2. M. W. PANGBURN, M.D. | Miller |
| 3. H. R. BROWN, M.D. | Watertown |

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| 2. J. C. SHIRLEY, M.D. | Huron |
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| 2. J. V. MCGREEVY, M.D. | Mitchell |
| 3. W. A. DAWLEY, M.D. | Rapid City |

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| 3. H. T. KENNEY, M.D. | Watertown |

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| 2. C. E. SHERWOOD, M.D. | Madison |
| 3. G. J. VAN HEUVELEN, M.D. | Pierre |

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| 2. C. E. SHERWOOD, M.D. | Madison |
| 3. J. C. OHLMACHER, M.D. | Vermillion |

Advisory to State Departments

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| 2. C. E. ROBBINS, M.D. | Pierre |
| 3. F. C. NILSSON, M.D. | Sioux Falls |

ORTHOPEDICS

- | | |
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| 2. P. T. GEYERMAN, M.D. | Hot Springs |
| 3. H. P. MARTIN, M.D. | Harrold |
| 4. W. A. DELANEY, M.D. | Mitchell |

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| 2. GOLDIE ZIMMERMAN, M.D. | Sioux Falls |
| 3. M. W. PANGBURN, M.D. | Miller |

ANNUAL MEETING OF THE COUNCIL OF THE
SOUTH DAKOTA STATE MEDICAL
ASSOCIATIONFirst Meeting of the Council
May 18, 1941

The meeting was called to order by Dr. S. M. Hohf, chairman, at the Widmann Hotel, Mitchell, South Dakota, on Sunday, May 18, 1941, at 3 P. M.

Roll call was taken. Sixteen members were present. They were Drs. O. J. Mabee, B. M. Hart, C. E. Sherwood, J. R. Westaby, J. C. Shirley, J. D. Whiteside, D. S. Baughman, G. E. Burman, J. H. Lloyd, L. J. Pankow, S. M. Hohf, J. L. Stewart, R. V. Overton, C. E. Lowe and Wm. Duncan.

Minutes of the last meeting were approved as printed in the April, 1941, issue of the JOURNAL-LANCET. The reading of the minutes was omitted.

Next in order was the report of the Secretary-Treasurer. Chairman Hohf moved that the report of the Secretary-Treasurer be accepted and turned over to the Auditing Committee.

Dr. Mabee made a motion that Dr. Pankow be seated as a Councillor in place of Dr. Donahoe, who is absent, and be accorded the right to vote. Dr. Lloyd seconded the motion. Motion carried.

Dr. Pankow stated that he was present as an observer only and he thought that this procedure was illegal.

Dr. Baughman made a motion that Mr. Goldsmith's bill for \$300 for professional services during the 1941 session of the legislature, and all other legislative expenses be allowed and taken from the Legislative Fund. Dr. Lloyd seconded the motion. Motion carried.

There was no old business.

Under new business, Dr. Pankow brought up the subject of a case in Minnehaha county whereby a woman claiming to be a nurse was prescribing diets and treatments, without being a registered nurse. He asked for information as to what procedure could be taken to remedy the matter. There followed a general discussion by the different members of the Council. The consensus of opinion was that something should be done but that the remedy would have to be started locally.

Mr. Forseth, of the Lumberman's Mutual Casualty Company discussed the matter of malpractice insurance for physicians. He desired the Council to recommend his company to the members of the Association.

Dr. Duncan moved to refer the matter to a committee or lay it on the table. Motion prevailed. The Chairman will appoint a committee. The committee will discuss the matter and it will be brought up at a future meeting.

Dr. Pankow led a discussion on malpractice suits. This matter will be discussed at the evening meeting.

Dr. Duncan discussed the increasing difficulty of obtaining student nurses due to the fact that the increased requirements, brought about by the National Nurses Association, are too high, for conditions as they are in South Dakota. Dr. Shirley discussed it also.

Dr. Shirley made a motion that there be a committee of three appointed to discuss this matter with a committee from the Hospital Association and then have this committee report back, and to the Hospital Association and forward copies of the recommendations to the State Nurses Association. Dr. Duncan seconded the motion. Motion carried.

Chairman Hohf appointed Drs. Baughman, Lloyd and Shirley on the Auditing Committee; Drs. Hart, Lloyd and Whiteside on the Indemnity Insurance Committee; and Drs. Duncan, Shirley and Baughman on the Nurses Committee.

Meeting was adjourned.

**Second Meeting of the Council
May 20, 1941**

The Council met for breakfast at the Widmann Hotel at 6:30 on the above date. Members present were: Dr. S. M. Hohf, chairman, Drs. B. M. Hart, D. S. Baughman, C. E. Robbins, R. V. Overton, C. E. Sherwood, J. D. Whiteside, W. E. Donahoe, O. J. Mabee and Attorney Karl Goldsmith. L. J. Pankow, Sioux Falls, sitting in.

General discussion was held relative to the advisability of holding a concurrent meeting with that of the other groups of the Allied-Council. It seemed to be the consensus of opinion that should the other groups desire a concurrent meeting that the medical association should cooperate.

Dr. Hart presented a report on the special committee appointed to bring in a report on physician's liability insurance. After general discussion, Dr. Robbins moved that action on the report be indefinitely postponed. This was seconded by Dr. Overton and on vote, motion was lost. Dr. Baughman moved that the matter be referred to the committee on medical defense with instructions to investigate indemnity insurance and report at next year's meeting with recommendations. This motion was seconded by Dr. Robbins and passed.

A bill in the amount of \$6.05 was presented by Dr. Duncan for postage incurred in the work of the committee on medical defense. It was moved by Dr. Mabee and seconded by Dr. Robbins that the bill be allowed. Motion carried.

Dr. W. E. Donahoe presented bill for postage and expense incurred relative to the radio committee. Moved by Dr. Baughman and seconded by Dr. Robbins that the bill be allowed at \$6.50. Motion carried.

The auditing committee report was presented by Dr. Baughman who moved its adoption. Seconded by Dr. Mabee and carried. The auditing committee also presented tentative budget for 1941-42. Its acceptance was moved by Dr. Baughman and seconded by Dr. Whiteside. Motion carried.

Next matter to come up was the election of a chairman for the ensuing year. Dr. Mabee nominated Dr. D. S. Baughman. Dr. Hart supported the nomination. There being no further nominations it was moved by Dr. Robbins and seconded by Dr. Mabee that the nominations be closed and the secretary be instructed to cast a unanimous ballot for Dr. Baughman. Motion carried and Dr. Baughman was elected.

General discussion of F. S. A. set-up at Pierre was held. It was moved by Dr. Whiteside and seconded by Dr. Donahoe that copy of the report of the Pierre district Councilor relative to this matter be sent to each officer and delegate of the various districts. This motion carried.

With no further business, meeting was adjourned.

CLARENCE E. SHERWOOD, M.D.,
Secretary-Treasurer.

Report of Secretary

Your secretary has endeavored to keep the membership acquainted with the work of the State Association. To that end there was inaugurated, a "Secretary's Letter" in the JOURNAL-

LANCET, the first appearing in the October issue. Subsequent letters containing association news, announcements, report of the delegate to the American Medical Association, minutes of the Council meetings, etc., appeared in the November, December, February and April issues. The minutes of the Council meeting of August 2nd was presented in the October 1940 issue of the JOURNAL-LANCET as was also the report of the Delegate to the American Medical Association which was presented at that meeting. Minutes of the October 29th Council meeting appeared in the December issue while that of the February 5th meeting appeared in the April 1941 issue.

In addition to this, six special mimeographed bulletins were sent out during the year. A special letter was sent to all the non-member physicians in the state thought to be eligible for membership, urging them to join their district societies. A few new members were added through this effort.

This was a legislative year and a considerable amount of correspondence and telephoning in this connection, was done, making contacts with key men throughout the state.

Letters of condolence have been written to families of deceased members where notification of the deaths was forwarded by the district secretary.

Four active members of the Association have been called from our midst by death and many more have been called into government service.

The following is an analysis of membership by districts showing a comparison with last year's figures.

	Dec. 31, 1940	May 18, 1940	May 17, 1941
District 1	36	35	30
District 2	20	19	22
District 3	26	23	23
District 4	18	15	14
District 5	16	16	12
District 6	25	23	24
District 7	51	50	46
District 8	39	35	28
District 9	56	52	49
District 10	6	6	7
District 11	9	9	11
District 12	18	16	13
	<u>320</u>	<u>299</u>	<u>279</u>

Number of Physicians in State exclusive of Federal government employees	428
Number of Physicians carried as affiliate members	15
Number of paid-up members May 17, 1941	279
Number of potential active members	134
Number of Government physicians carried by district societies as honorary	12

**Report of Secretary-Treasurer
May 17, 1941**

May 17, 1940, Balance on Hand	\$2,981.30
Receipts:	
Back dues received for 1940	\$ 220.00
Expense, speakers from F. P. H. S.	30.00
Refund expenses from Mayo Clinic	59.40
Social security refund, B. A. Dyar	15.00
Social security refund, C. E. Sherwood	31.00
1941 dues, 279 members	2,790.00
	<u>\$6,126.70</u>
Disbursements:	
Lincoln Hotel, rooms, guests	\$ 58.75
Speakers expense, travel	178.40
Printing and supplies	68.89
Secretary-Treasurer, salary	1,200.00
Travel expense, secretary-treasurer	60.90
Telephone toll	86.82
Badges, state meeting	8.36
Programs, state meeting	54.28
Postage	124.90

Council expense, mileage and meals	419.72
Watertown meeting, to district society, local expense	31.23
Bond, secretary-treasurer	5.00
JOURNAL-LANCET	610.00
Directory	15.00
Delegate, A. M. A.	133.45
Inter-Allied Council	50.00
Miscellaneous	26.35
Social security, payments, penalty and interest	118.62
Refund, overpaid dues	10.00
Benevolent fund	160.00
Karl Goldsmith, retainer	300.00
Legislative expense, miscellaneous	52.42
Float charge	.60
	<hr/>
	\$3,773.69
Balance on Hand, May 17, 1941	2,353.01
	<hr/>
	\$6,126.70

LEGISLATIVE FUND

In savings account, May 6, 1940	\$610.46
Interest credit March 31, 1941	8.99
	<hr/>
Balance in account, May 17, 1941	\$619.45

CLARENCE E. SHERWOOD, M.D.,
Secretary-Treasurer.

HOUSE OF DELEGATES, SOUTH DAKOTA STATE MEDICAL ASSOCIATION

First Meeting
May 18, 1941

The meeting of the House of Delegates was called to order by Dr. O. J. Mabee, President, on May 18, 1941, at 7:30 p. m., in the Widmann Hotel, Mitchell, South Dakota.

Roll call was taken, 26 members being present. They were Drs. O. J. Mabee, B. M. Hart, C. E. Sherwood, J. R. Westaby, J. D. Whiteside, D. S. Baughman, C. E. Robbins, G. E. Burman, J. H. Lloyd, S. M. Hohf, J. L. Stewart, R. V. Overton, C. E. Lowe, Wm. Duncan, J. C. Shirley, J. F. Adams, B. C. Murdy, J. B. Vaughn, L. E. Jordan, G. E. Whitson, L. W. Tobin, E. W. Jones, L. G. Leraan, L. J. Pankow, G. W. Mills, C. L. Olson and W. H. Karlins.

Dr. J. R. Westaby moved that a message wishing him a speedy recovery be sent to Dr. N. J. Nessa, who is ill in a hospital at Rochester. Dr. Hohf seconded the motion. Motion carried.

Dr. Lowe moved that all alternate delegates present be seated. Dr. Baughman seconded the motion. Motion carried.

Dr. Mabee gave his presidential address.

The following reference committees were appointed by President O. J. Mabee: Reports of Officers—D. S. Baughman, M.D., C. E. Robbins, M.D., C. E. Lowe, M.D. Resolutions and Memorials—B. A. Bobb, M.D., J. L. Stewart, M.D., Wm. Duncan, M.D. Amendments to Constitution and By-Laws—L. W. Tobin, M.D., J. R. Westaby, M.D., L. J. Leraan, M.D., B. C. Murdy, M.D., S. M. Hohf, M.D. Nominations and Place of Meeting—J. F. Adams, M.D., J. B. Vaughn, M.D., L. E. Jordan, M.D., O. A. Kimble, M.D., G. E. Burman, M.D., W. H. Karlins, M.D., E. W. Jones, M.D., L. J. Pankow, M.D., F. W. Haas, M.D., R. J. Quinn, M.D., C. L. Olson, M.D., G. W. Mills, M.D.

Minutes of the 1940 session were presented by the secretary as printed in the July, 1940, issue of the JOURNAL-LANCET. Dr. Whiteside moved they be accepted as printed without reading. Dr. Vaughn seconded the motion. Motion carried.

The report of the Secretary-Treasurer was presented in mimeographed form and discussed. Dr. Jones moved that the Secretary-Treasurer's report be approved as mimeographed. Dr. Whitson seconded the motion. Motion carried.

The report of the Committee on Scientific Work was presented by Dr. Mabee.

A motion was made and seconded to accept this report and refer it to the appropriate committee. Motion carried.

The report of the Committee on Public Policy and Legislation was read by the President, Dr. Mabee.

A general discussion was held. Dr. Pittenger feels that the association should add to the report an expression of appreciation of the work done by Dr. Mills. We know he had a lot of other things to look after and yet he appeared on committees and was untiring in his efforts for the association.

Dr. Whitson also recommended that Karl Goldsmith be retained as our attorney. He put this into a motion. Dr. Hart seconded the motion. Motion carried.

A motion was made that Dr. Pittenger's suggestions be put into the Committee report and that the report be accepted. Seconded and carried.

Dr. Sherwood gave the report of the Committee on Publications. A motion was made and seconded to accept this report as read. Motion carried. Referred.

Dr. Pankow gave a verbal report for the Committee on Medical Defense. There had been only one malpractice suit brought during the year to the Committee's knowledge and that did not come to trial. Dr. Pankow moved the report be referred to an appropriate committee. He felt that the recommendations of the Committee made last year should be given consideration and some constructive work looking to the prevention of malpractice suits be done. Seconded and referred.

The report was read by the Secretary of the Committee on Medical Education and Hospitals. A motion was made and seconded to accept this report as read. Motion carried. Referred to appropriate committee.

The report of the Committee on Public Health was given by Dr. Baughman. Motion was made and seconded to accept this report as read. Motion carried and referred.

Dr. Jones led a discussion on tuberculosis. He stressed the fact that facilities for care of the tuberculous of the state at Sanator were inadequate. He recommended that a report of the situation together with a resolution urging the increase of its capacity to at least 1,000 beds, be made to the proper authorities in Washington. Dr. Duncan further discussed this matter. He recommended that a second sanatorium be built somewhere east of the Missouri River in South Dakota rather than an increase in the capacity of Sanator.

Dr. Pankow moved that the recommendations of Dr. Jones and Dr. Duncan be put into a report. Dr. Hart seconded the motion. Motion carried. Dr. Jones made a motion that this committee get busy on this matter right away, as it is an emergency. Dr. Pankow seconded the motion. Motion carried.

A report on Necrology by Dr. Quinn was given by Dr. Sherwood. Motion was made and seconded to accept this report as read. Motion carried and referred.

Dr. Donahoe sent his report of the radio broadcast over KSOO, Sioux Falls, to Dr. Sherwood to be read. Motion made and seconded to accept this report as read. Motion carried and referred to Committee.

An Editorial Committee report was given by Dr. Pittenger. He urged the matter of having the younger doctors send in papers to the editorial department of the JOURNAL-LANCET for publication, instead of having the editors beg them to send in papers.

This report was discussed by Drs. Duncan, Hohf and Jones questioning whether the JOURNAL-LANCET really did represent the medical profession of South Dakota and citing incidents whereby papers presented by South Dakota men were held up so long before publication that they had lost their point, and wondering if something couldn't be done whereby South Dakota doctors would receive more consideration. The report was referred to proper committee.

Dr. Hopkins' report on Allied Groups was read by Dr. Sherwood. Motion was made and seconded that this report be accepted as read. Motion carried and was referred to committee.

A report on Military Affairs was given by Dr. Duncan. He also gave a report on Medical Preparedness Committee of South

Dakota for 1940-41. A motion was made and seconded this report be accepted. Motion carried and referred.

There was no report on Radiology or on Postgraduate Course.

Dr. Sherwood read a report on the Spafford Memorial Fund. Motion was made and seconded to accept this report as read. Motion carried and referred.

There was no report on Ophthalmology and Otolaryngology Advisory Committee.

Dr. Van Demark's report on Orthopedics was read by Dr. Sherwood. A motion was made and seconded that this report be accepted as read. Motion carried and referred.

There were no reports from Councilor Districts 1 and 2.

Dr. Baughman gave a report on the 3rd district. It was referred.

Dr. Burman gave a short report for district 5. Referred.

Dr. Lloyd reported for district 6. Referred.

Dr. Pankow reported for district 7. Referred.

Dr. Hohf reported for district 8 and was referred.

Dr. Stewart reported from district 9. Referred.

No report from district 10.

Dr. Lowe reported from District 11. Referred.

Dr. Duncan reported from district 12. Referred.

The Benevolent Fund under organization of the joint auspices of the South Dakota State Medical Association and Women's Auxiliary was reported on by Dr. Baughman and was discussed. Mrs. Nilsson informs us that the plan we have worked out will be submitted at the Auxiliary at the State Meeting for adoption and it will be turned over to us for further action. A motion was made and seconded that this report be accepted. Motion carried.

The matter of the proposed amendments to the By-Laws relating to the Medical Defense Committee was brought up. It was moved and seconded to refer it to the committee on amendments to the constitution and by-laws. Carried.

New Business:

Dr. Mills moved that Dr. J. L. Stewart be accepted as an affiliate member of the Association at the request of the 9th district. Dr. Whiteside seconded the motion. Motion carried.

Dr. Hohf moved that Dr. J. S. Kalayjian be accepted as an affiliate member of the Association at the request of the 8th district. Dr. Lloyd seconded the motion. Motion carried.

Dr. Baughman moved that Dr. Christian J. Engleson be accepted as an affiliate member of the Association at the request of the 3rd district. Dr. Westaby seconded the motion. Motion carried.

Dr. Whiteside moved that Dr. W. A. Bates be accepted as an affiliate member of the Association at the request of the first district. Dr. Westaby seconded the motion. Motion carried.

Dr. Burman moved that Dr. Grovner of Huron be accepted as an affiliate member of the Association at the request of the 5th district. Dr. Mills seconded the motion. Motion carried.

Dr. J. L. Stewart offered his resignation as Councilor from the 9th district because of his change in status from active to affiliate membership. Dr. Leraan moved that Dr. Stewart's resignation be accepted. Dr. Mills seconded this motion. Motion carried.

Dr. Baughman reported on a matter at the request of the third district in which they suggested that, in view of the fact that the best defense was a strong offense, we should begin to lay plans now for an aggressive legislative program definitely aimed at defining the practice of medicine, osteopathy, etc., and keeping it within those limits. He moved that a committee be appointed to confer with our attorney and make plans along this line. Dr. Leraan seconded the motion. Motion carried. A general discussion was held. Dr. Baughman moved that this matter be referred to the legislative committee. Dr. Pittenger seconded the motion. Motion carried.

Dr. Leraan moved that the Northwest District Councilor be elected for a two year term in order to get back to four members elected each year as provided in the By-Laws. Dr. Burman seconded the motion. Motion carried.

Dr. Stewart's term has two years yet to run and this office will have to be filled.

Dr. Hohf indicated he would not be a candidate for reelection and suggested that Dr. Ohlmacher be considered as a candidate.

Dr. Duncan brought up the question of the young physicians who were inducted into the army. He suggested that consideration be given to a proposition that men at the end of their service if they have served over a year, be awarded a bonus to help them return to practice. No action.

Dr. Robbins moved that members called active, be made honorary members of the Association and be not required to pay their dues, while in service. They will not receive the JOURNAL-LANCET except by personal subscription. Dr. Whiteside seconded this motion. Motion carried.

Dr. Baughman moved that Karl Goldsmith be retained as counsel for another year. Dr. Westaby seconded the motion. Motion carried.

Meeting adjourned.

CLARENCE E. SHERWOOD, M.D.,
Secretary-Treasurer.

Second Meeting of the House of Delegates May 19, 1941

The second meeting of the House of Delegates was called to order by the President, Dr. O. J. Mabee, at 4:45 p. m. in the Masonic Temple, Mitchell, South Dakota.

The secretary called the roll, the following members being present: Drs. O. J. Mabee, B. M. Hart, C. E. Sherwood, J. R. Westaby, J. D. Whiteside, D. S. Baughman, C. E. Robbins, G. E. Burman, W. E. Donahoe, J. H. Lloyd, S. M. Hohf, R. V. Overton, Wm. Duncan, J. F. Adams, J. B. Vaughn, L. E. Jordan, G. E. Whitson, L. W. Tobin, E. W. Jones, L. G. Leraan, L. J. Pankow, F. W. Haas, J. A. Hohf, G. W. Mills, R. J. Quinn and C. L. Olson.

Dr. Tobin moved that the regular procedure of business be dispensed with and that we get to the business at hand. Dr. Jones seconded the motion. Motion carried.

Dr. B. M. Hart's address was not read but was turned over to the secretary to be printed in the JOURNAL-LANCET. He made a few brief remarks.

The report of the Nominating Committee was presented as follows:

President-Elect—N. J. Nessa, Sioux Falls, O. J. Mabee, Mitchell.

Vice-President—J. C. Ohlmacher, Vermillion, S. M. Hohf, Yankton.

Councilor Aberdeen District No. 1—1941-44—J. L. Calene, Aberdeen.

Councilor Watertown District No. 2—1941-44—A. E. Johnson, Watertown.

Councilor Pierre District No. 4—1941-44—C. E. Robbins, Pierre.

Councilor Yankton District No. 8—1941-44—E. M. Stansbury, Vermillion.

Councilor Northwest District No. 11—1941-43, C. E. Lowe, Mobridge.

Councilor Black Hills District No. 9—1941-43, R. E. Jernstrom, Rapid City.

Place of meeting, 1942—Sioux Falls, Rapid City.

Dr. Pankow nominated from the floor, Dr. H. R. Brown from the Watertown district, as a Councilor for that district, the reason being that Dr. Brown, at a district society meeting held for the purpose of instructing the delegate as to the wishes of the society for a nominee, had received a majority of the votes, the vote being 7 to 6 in his favor.

A discussion of the action of the nominating committee by several of its members followed. Balloting then took place. Dr. Mabee appointed Drs. Jones, Pankow and Whitson tellers of the election. A motion was made and seconded that the written ballot of Dr. Karlins, who was absent, be counted. Motion carried.

Report of the tellers showed the following elected:

President-Elect—N. J. Nessa, Sioux Falls.

Vice-President—J. C. Ohlmacher, Vermillion.

Councilor Aberdeen District No. 1—1941-44—J. L. Calene, Aberdeen.

Councilor Watertown District No. 2—1941-44—H. R. Brown, Watertown.

Councilor Pierre District No. 4—1941-44—C. E. Robbins, Pierre.

Councilor Yankton District No. 8—1941-44—E. M. Stansbury, Vermillion.

Councilor Northwest District No. 11—1941-43—C. E. Lowe, Mobridge.

Councilor Black Hills District No. 9—1941-43—R. E. Jernstrom, Rapid City.

Place of meeting, 1942—Sioux Falls.

The minutes of the last meeting were read by the secretary. Minutes were accepted and approved as read.

Dr. Baughman gave the report for the Committee on report of officers. Motion was made and seconded this report be accepted and published in the JOURNAL-LANCET. Motion carried.

Dr. Bobb gave a report for the Committee on Resolutions and Memorials. Report was accepted.

Dr. Baughman read a report given to him by the Ladies Auxiliary whereby they requested we take an equal responsibility in handling of the Benevolent Fund, and that a similar committee of the association act jointly with them in the management of the fund. Dr. Baughman moved that the committee be composed of the secretary (ex officio) and three members elected, one to serve one year, the second, two years, and the third, three years, and each member thereafter shall serve three consecutive years. Motion was seconded and carried.

A motion was made and seconded to make these members appointive by the president instead of elective. Motion carried.

A report was given on the financial standing of the Benevolent Fund. Dr. Pankow moved that 50c per member be appropriated out of the General Fund for the Benevolent Fund for the ensuing year. Motion seconded and carried.

Dr. Tobin reported for the Committee on Amendments to the Constitution and By-Laws that the proposed amendments to the by-laws relative to the Committee on Medical Defense had much of merit in them but recommended that the committee be continued and instructed to make further study and some changes and present at next year's meeting for action. Motion was seconded and carried.

Dr. Duncan brought up the matter of the Basic Science Bill and the matter of refugees practicing medicine in the United States without a license. A general discussion was held.

Dr. Pankow moved that the Legislative Committee begin to make plans now for the next session of the legislature with the view of providing a remedy for the problems incident to licensure. Motion was seconded and carried.

Dr. Pangburn gave a report on the program of the State Board of Health's Maternal and Child Welfare division. He presented the request of Dr. Cook, the Superintendent of the Board, that his advisory committee of Physicians be made an official committee of the State Association.

Dr. Whitson moved that the above committee composed of Drs. Jernstrom, Zimmerman and Pangburn be accepted by the society. Dr. Adams seconded the motion. Motion carried.

The matter of the National Physician's Committee was discussed. Dr. Pankow moved that this Association endorse the committee activities and recommend its support by the District Societies and individual members. Drs. Baughman and Lloyd seconded the motion. Motion carried.

Dr. Pankow suggested that in the future we arrange our programs with a little more time to threshing these matters out and also arrange the programs so that we will know in advance about what will be discussed. In behalf of Sioux Falls, he thanked the Association for choosing Sioux Falls for its meeting place next year and promised to make our stay there enjoyable and show us just as good a time as Mitchell has shown us this year.

The meeting adjourned.

REPORT OF THE AUDITING COMMITTEE

Honorable Council: The following is a report of the Auditing Committee.

1. All cash taken in, checked against deposit slips in bank and found correct.

2. All bills paid, checked against cancelled checks from the bank and found correct.

3. The Legislative account, checked separately.

Accounts received checked against bank deposit slips and were found to be correct.

All bills paid, checked against cancelled checks and were found correct.

Therefore, the Committee found the Secretary's books to be complete in first-class shape and all accounts checking correct.

The Committee on behalf of the Council, wishes to thank the Secretary, Dr. C. E. Sherwood, for his capable and complete system of handling the State Society accounts.

D. S. BAUGHMAN, M.D., *Chairman*.

ESTIMATED BUDGET, 1941-42

Estimated Receipts	\$3,200.00
Estimated Expenses:	
Hotel guests	\$ 60.00
Travel expense	175.00
Printing and supplies	125.00
Secretary-Treasurer, salary	1,200.00
Retainer, Goldsmith	300.00
Council meetings	400.00
JOURNAL-LANCET	600.00
Postage	100.00
Telephone	50.00
Bond	5.00
Delegate	100.00
Social security	12.00
Miscellaneous	73.00
Total	\$3,200.00

REPORT OF COMMITTEE ON SCIENTIFIC WORK

The Committee presents as its report, the printed program of the Sixtieth Annual Session of the South Dakota State Medical Association. A few adjustments were necessary in time of presentation owing to train and plane connections.

Dr. Hart was not able to be with us because he was called to service. Dr. E. T. Evans, Department of Surgery, University of Minnesota, very kindly consented to fill Dr. Hart's place on the program.

Dr. J. C. Ohlmacher was unable to be with us and his paper was presented by his associate, Dr. Fred Dick.

SCIENTIFIC PROGRAM

Monday, May 19, 1941

9:00 A. M. Orthopedic Clinic—E. T. Evans, M.D., Minneapolis, Minn., Department of Surgery, University Hospital, University of Minnesota.

10:00. Surgical Clinic—Sumner L. Koch, M.D., Chicago, Ill., Assistant Professor of Surgery, Northwestern University Medical School; Attending Surgeon, Passavant Memorial and Cook County Hospitals, Chicago, Ill.

11:00 Intermission. Visit exhibits.

11:20 Pediatric Clinic—W. H. Thompson, M.D., Minneapolis, Minn., Department of Pediatrics, University of Minnesota; Postgraduate Instructor Tennessee State Medical Association.

12:20 Noon intermission.

1:30 P. M. Heredity and Diseases of the Skeletal System—E. T. Evans, M.D., Minneapolis, Minn.

2:00 Insidious Loss of Vision—Kenneth C. Swan, M.D., Iowa City, Iowa, Assistant Professor in Ophthalmology, State University of Iowa, College of Medicine.

2:30 The Medical Profession's Responsibility in the Control of Cancer—J. C. Ohlmacher, M.D., Vermillion, S. D., Dean, University of South Dakota School of Medical Sciences. (Paper read by Dr. Fred Dick, Assistant Professor of Pathology, School of Medical Sciences, University of South Dakota.)

3:00 Intermission. Visit exhibits.

3:30 Some Surgical Principles in the Treatment of Infections of the Hand—Sumner L. Koch, M.D., Chicago, Ill.

4:00 Bleeding Tendencies in the New-born and Its Prevention—W. H. Thompson, M.D., Minneapolis, Minn.

7:00 Banquet, Masonic Temple. Toastmaster—William A. Delaney, Mitchell, S. D. Introduction of Officers and Guests. "The Art of Medicine"—Roy W. Fouts, M.D., Omaha, Nebraska, Professor and Head of Department of Forensic Medicine and Medical Economics, Creighton University School of Medicine.

Tuesday, May 20, 1941

8:00 A. M. Dermatology Clinic—Henry E. Michelson, M.D., Minneapolis, Minn., Professor of Dermatology, Director of Division of Dermatology and Syphilology, the University of Minnesota.

9:00 Urology Clinic—Fredrick E. B. Foley, M.D., St. Paul, Clinical Associate Professor of Urology, Clinical Associate Professor of Surgery, the University of Minnesota.

10:00 Intermission. Visit exhibits.

10:20 Internal Medicine Clinic—James B. Carey, M.D., Minneapolis, Minn., Clinical Associate Professor of Internal Medicine, the University of Minnesota.

11:20 The Progress of X-Ray Technique—Robert G. Allison, M.D., Minneapolis, Minn.

11:50 The Relationship of Dermatology to General Medicine—Henry E. Michelson, M.D., Minneapolis, Minn.

12:20 P. M. Intermission. Noon.

12:30 Medical Veterans' Luncheon. X-Ray Round Table Discussion—Robert G. Allison, M.D., Minneapolis, Minn., Clinical Assistant Professor of Radiology, the University of Minnesota. (Bring your films for discussion.)

2:30 Relation of the Medical Profession to Selective Service—Lieutenant Colonel Richard Eanes, Washington, D. C.

3:00 Medical Problems of Selective Service in South Dakota—Major R. F. Sackett, Rapid City, State Medical Officer for Selective Service.

3:30 Diagnosis and Treatment of Bladder Neck Obstruction—Fredrick E. B. Foley, M.D., St. Paul, Minn.

4:30 Chronic Gastritis—James B. Carey, M.D., Minneapolis, Minn.

5:00 Adjournment.

O. J. MABEE, M.D., *Chairman.*

REPORT OF COMMITTEE ON PUBLIC POLICY AND LEGISLATION

We have just come through another legislative year in which several bills of interest came up for consideration.

Senate Bill 63, which provided for a remedy by injunction, against anyone practicing a profession requiring a license without such a license, was thought by the committee to be O.K. and so far as we were concerned, gave it our O.K. However, the bill lost in the Senate committee because of the opposition brought by the farmers who felt that this might prohibit them from taking care of their own livestock vaccinations, etc.

House Bill 212 as originally contemplated by the State Optometry Association was obnoxious to us because of the fact that it required physicians who did refractions to get a special license to do so under the optometry board. At a conference with their representative, this difference was ironed out and the bill as passed was satisfactory to us.

Senate Bills 198, 199, 200, 201 introduced by the committee on food and drugs was felt to be O.K. as they simply unified our code with the recommendation of the federal government in relation to habit forming drugs.

Senate Bill 279 authorized municipalities of the third class to establish and maintain hospitals and medical dispensaries and to regulate the same. Did not meet with our opposition.

Senate Bill 73, known as the Osteopathic Surgery Bill which was almost identical to the one introduced two years ago, was of course opposed by your committee. A meeting was held of the entire committee with the Council in Pierre just following the legislative recess. Conferences were had with our legislators and arrangements made for a committee hearing. The following week members of the special legislative committee, Drs. E. A. Pittenger, C. E. Sherwood, J. C. Shirley, O. J. Mabee and

others met with the committee and presented our views which were in brief, that we did not object to the osteopaths doing surgery simply because they were osteopaths but that their preparation and qualifications were not on a par with those of the medical men and to legislate to them the privilege of doing surgery would be setting up a double set of qualifications for doing the same work. Committee received us very well and subsequent to our appearance the bill was reported out without recommendations. When it came out on the floor of the Senate, Senator Olson from Turner County, moved that the bill be indefinitely postponed which motion carried almost unanimously and thus disposed of this bill for another session.

House Bill 205, which had for its purpose the removal of the discretionary powers of the State Board of Medical Examiners in determining the qualifications and educational prerequisites necessary for the examination. This bill was referred to the House Committee on Public Health and was kept there by the good work of our friends who were members of that committee.

Your committee wishes to commend the good work done by our attorney, Karl Goldsmith, and members of our association located in Pierre in keeping track of things for us and seeing that they did not get out of control. We wish especially to express our appreciation to Dr. G. W. Mills, of Wall, a member from the 9th Councilor District, who did excellent work in the House this session. Although on many important committees and busy he was never too busy to look after the interests of the physicians at all times.

Respectfully submitted,

Committee—O. J. MABEE, M.D., *Chairman.*

May 18, 1941.

REPORT OF COMMITTEE ON PUBLICATIONS

The Committee on Publications wishes to submit the fact that the JOURNAL-LANCET contract still is in force and that the JOURNAL-LANCET will be the official publication of the association for an additional period to July 1943.

CLARENCE E. SHERWOOD, M.D., *Chairman.*

May 18, 1941.

REPORT OF COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

Your committee on Hospitals and Medical Education presents the following report:

One of the Committee through his membership on the University of South Dakota committee has been able to keep before that body the cause of the Medical School and its needs. The Association was very interested in securing a definite appropriation for a new building on the University of South Dakota campus. This new building will release space in the Science Hall which now houses the Medical School and permit the expansion of the medical school from its present cramped quarters. The Committee on Medical Schools that examined our University recommended a few years ago that the School of Medicine needed more space to meet their requirements. The library facilities have been expanded and need further expansion to meet the ever increasing demands both of the student body and the standards set up by the accrediting committee for medical schools.

The Committee wishes to correct an erroneous idea that some carry relative to the School of Medicine and its present accreditation.

The School of Medicine is a fully accredited Class A—2 year school. Its graduates are accepted for completion of the Clinical years in medicine in any Class A—4 year school. There has been no difficulty whatever in placing our graduates. To illustrate the high regard in which our graduates are held, I hereby list the 4 year medical schools to which our 1941 graduates are transferring and the number of students accepted by each:

Washington University, St. Louis.....	2
Johns Hopkins University, Baltimore.....	1
Long Island University, New York.....	1
Louisville University, Louisville.....	2
Loyola University, Chicago.....	1

University of Minnesota, Minneapolis	1
University of Nebraska, Lincoln	1
Northwestern University, Chicago	4
Ohio State University, Columbus	1
University of Pennsylvania, Philadelphia	1
Temple University, Philadelphia	4
Vanderbilt University, Tennessee	1
University of Vermont	2

The reason I mention the foregoing facts in this report is because now and then word comes to us that some of the medical men in this state have told prospective applicants to the University of South Dakota School of Medicine that it would be better if they did not attend at Vermillion because of the difficulty experienced in transferring at the end of the pre-clinical years. This report is absolutely unfounded—attesting to this fact is the knowledge that all the twenty-two graduates of this year's class have been accepted in outstanding recognized clinical schools of the country.

The State of South Dakota may be justly proud of the high rating of its Medical School, that has weathered adverse conditions in state and nation largely by personal sacrifice and loyal support given the school by Dean Ohlmacher and his associates.

Signed: Committee on Hospitals and Medical Education,
FARIS PFISTER, M.D., *Chairman.*

REPORT OF COMMITTEE ON PUBLIC HEALTH

To the Officers of the South Dakota State Medical Association.
Gentlemen:

As General Chairman of the Public Health Committee, I have to report as follows: I have contacted the Chairmen of all the sub-committees and submit the report of Dr. J. C. Ohlmacher, Chairman of the Sub-committee on Cancer, as follows:

"A meeting of the 'Sub-committee on Cancer' was held at the Cataract Hotel, Sioux Falls, on the afternoon of January 17, 1941. Members of the committee present were Drs. J. C. Ohlmacher, Vermillion, E. I. Conner, Alcester, and T. J. Billion, Sioux Falls. Driving on this date was extremely hazardous which prevented the attendance of Dr. M. C. Jorgenson, Watertown, member of the committee, and Dr. G. J. Van Heuvelen, representing the State Board of Health. In addition to the committee members the following, representing the Women's Field Army of the American Society for the Control of Cancer were present: Mrs. Nathalie Nelson Tollefs, Sioux Falls, State Commander of the Women's Field Army, Mrs. H. W. Peterson, Billings, Montana, Regional Deputy Commander of the Women's Field Army, and Wm. Perrenoud, Sioux Falls, treasurer of the South Dakota Branch of the Women's Field Army.

"At this meeting plans were discussed as to the best methods of perfecting a worthwhile organization in South Dakota. Of special importance was the fact that the present limited resources of the State's Women's Field Army prevented the launching of a state-wide campaign at this time.

"It was agreed that state-wide interest in the cancer control program might be awakened by presenting several talks on cancer, either through the medium of the daily press or by radio. It was hoped that such a program would so arouse sufficient interest in the state that enrollment in the Women's Field Army would be materially augmented. As a result of this conference, the chairman of this committee made arrangements to prepare and broadcast talks on the subject of Cancer Control, over WNAX.

"These talks have aroused considerable interest as attested by the fact that many letters of congratulation and inquiry have been received not only from South Dakota, but from Iowa, Minnesota, and North Dakota.

"Requests for copies of these talks have been made by each of the individuals interested. Copies of these talks have been prepared and sent to these interested parties. We have other copies available which will be turned over to Mrs. Tollefs for distribution.

"In addition to the talks given over WNAX several were

also sent over KSOO. These latter were prepared and broadcast by Sioux Falls physicians and Mrs. Tollefs, State Commander, as follows:

"Sunday, March 16, 1:15 P. M.: 'Diagnosis of Cancer'—Dr. Paul R. Billingsley. Sunday, March 23, 1:15 P. M.: 'The Women's Field Army'—Mrs. Albert Tollefs, State Commander, Women's Field Army. Sunday, March 30, 1:15 P. M.: 'Diagnosis and Surgical Treatment'—Dr. G. I. W. Cotnam. Sunday, April 6, 1:15 P. M.: 'Diagnosis and Treatment—X-Ray and Radium'—Dr. John Kittelson.

"Your chairman and Mrs. Tollefs also attended the regional meeting of the Women's Field Army held at Rochester, Minnesota, on February 6 and 7, 1941. This meeting was attended by representatives from North Dakota, Nebraska, Minnesota, Wisconsin, Missouri, and Iowa. The members of the organization were guests of the Mayo Clinic. The meetings were held in the Kahler Hotel and the Mayo Foundation House. Among other interesting things presented was a symposium on Cancer prepared by the Mayo Clinic group. Many of the talks were movie-tone and technicolor.

"In addition to the above activities, the committee, through its chairman, has contacted at least one physician in each councilor district. All of the following have expressed their willingness to give talks on cancer in their district, or see that such talks are given. They will also do what they can to further the interest of the program in any way: Dr. P. R. Billingsley, Sioux Falls, Sioux Falls District; Dr. J. L. Calene, Aberdeen, Aberdeen District; Dr. D. A. Gregory, Milbank, Whetstone District; Dr. Lyle Hare, Spearfish, Black Hills District; Dr. L. E. Lande, Winner, Dr. J. E. Studenberg, Gregory, Rosebud District; Dr. O. S. Randall, Watertown, Watertown District; Dr. G. E. Whitson, Madison, Madison District; Dr. O. R. Wright, Huron, Huron District; Dr. C. E. Robbins, Pierre, Pierre District; Dr. E. M. Young, Mitchell, Mitchell District; Dr. T. D. Jones, Chamberlain."

A report of Dr. H. D. Sewell, Chairman of the Sub-committee on Syphilis Control Program, U.S.P.H. Program, as follows:

"In order to assist in the control of venereal diseases in the state, the State Board of Health in cooperation with the United States Public Health Service adopted the 'chemical quarantine' plan of syphilis control. This plan is based on the principle that successful control depends on finding the infectious cases of syphilis and keeping them under treatment until they have been rendered non-infectious.

"Under the 'chemical quarantine' plan physicians are paid for each weekly report indicating that a treatment has been given to a patient with infectious syphilis. Originally a fee of 50c was paid for such report. Since July 1, 1940, however, a fee of \$1.00 has been paid for each report and in cases of pregnant women the fee has been raised to \$2.00. Free antisyphilitic drugs are furnished to physicians for treatment of reported cases.

"The success of this plan is shown by the fact that syphilis reporting has almost tripled in 1940 over the reporting in previous years. During 1940 there were 410 patients placed under 'chemical quarantine' including thirty-six cases of pregnant women. One hundred and thirteen physicians participated in the program and fees in the amount of \$3,633.00 were paid, or an average of \$32.15 per physician.

"The South Dakota plan has received very favorable comment from officials of the United States Public Health Service and it is proposed that the same plan be continued in the future.

"An additional demand on the state's venereal disease control funds has been made by the Selective Service regulation which provides that a blood test shall be made on all draftees. During the past year it has been necessary to purchase additional laboratory equipment and employ additional personnel in order that the laboratories might be able to carry this additional load.

"For the benefit of physicians cooperating in the venereal disease control program it is proposed that a certain number be sent each year to the Center for Continuation Study at the

University of Minnesota for a short course in venereal disease control with all expenses paid from federal funds allotted to the State Board of Health for training purposes."

The report of Dr. F. S. Howe, Chairman of the Sub-committee on Tuberculosis, as follows:

"Through the efforts of your tuberculosis committee, one piece of legislation was accomplished at the last session, which will be of value in the control of tuberculosis. Mr. Harold Doner of Custer introduced the bill, and it was passed without very much comment. The bill cut the cost of sanatorium hospitalization to the individual or county from \$15.00 a week to \$10.00 a week. The value of this legislation in the control of tuberculosis may not seem apparent; however, many individuals do not seek hospitalization because of the cost. Many commissioners urge the patients to leave the sanatorium before their tuberculosis is under control because of the cost.

"Further recommendations from your committee are that great efforts be put forth by the doctors to diagnose tuberculosis earlier. Tuberculin testing with fresh tuberculin on every private patient should be urged upon the private practitioners. The patch test properly applied is of considerable value. It is simple to do and fairly efficient. If these were done by the physician, there would be fewer lay groups trying to do this type of work. The follow-up with adequate X-rays of all reactors is the logical sequence of events. Proper X-rays are needed. A poor X-ray of the chest is a waste of the patient's money and a pit-fall for the doctor interpreting the film. Pneumothorax continues to be a valuable adjunct to the treatment of pulmonary tuberculosis. It is a procedure that is technically simple in most cases. It carries grave responsibilities, however, and should not be taken lightly. The tuberculosis committee urges upon every doctor interested in treating the tuberculous returning from the Sanatorium, to avail himself of the open invitation to the M.D.'s of the state to spend some time at the Sanatorium.

"After July first, the South Dakota State Sanatorium will go under the control of the State Board of Health. This makes the Sanatorium, and tuberculosis a more personal responsibility of the physicians in the state. There are probably 1,000 cases of active tuberculosis in South Dakota that are unknown. Every active case should be hospitalized. That these cases are not known is proved by the fact that in 1939 about 40 more cases died with tuberculosis than were reported as having the infection."

Also the following letter from F. V. Willhite, Chairman of the Sub-committee on Mental Hygiene and Child Welfare of the Public Health Committee of the South Dakota State Medical Association has been received.

"I have corresponded with the other members of this Sub-committee and have been unable to secure from them anything that has been done along the line indicated as the purpose of this committee, or any suggestions as to what might be done. I am, myself, as equally devoid of ideas. The facts are, we simply do not have anything to report. I am sorry that we can not make a better showing but must report the facts as they are."

I want to thank the Chairmen and members of the various Sub-committees for their coöperation and feel that through their efforts a good deal of good has been accomplished during the past year.

Respectfully,

D. S. BAUGHMAN, M.D.,
General Chairman, Public Health Committee.

REPORT OF COMMITTEE ON NECROLOGY

Whereas it has pleased a Divine Providence to call home several members of our medical organization, we offer this resolution to commemorate the memory of them for their unselfish devotion to the profession and to suffering mankind:

ALBERT LUKE STUBBS, age 74, Hot Springs, South Dakota, died June 12, 1940. He attended the College of Physicians and Surgeons at Keokuk, Iowa, and also the St.

Louis College of Physicians at St. Louis, Missouri. He died of injuries received in an automobile accident.

*FRIDOLIN JOHN OTTO KRAUSHAAR, age 54, Aberdeen, South Dakota, died June 26, 1940, of coronary occlusion. Dr. Kraushaar attended the State University of Iowa College of Medicine at Iowa City, Iowa, and was a member of the South Dakota Medical Association.

*ALBERT SPARR RIDER, age 63, Flandreau, South Dakota, died July 8, 1940, of coronary occlusion. Dr. Rider attended the Rush Medical College, at Chicago, Illinois, was past president of the South Dakota Medical Association; fellow of the American College of Surgeons; veteran of the Spanish-American and World Wars; also medical director of the Flandreau Indian School and Hospital.

WILLIAM PERRY COLLINS, age 65, Colman, South Dakota, attended the Bennett College of Eclectic Medicine and Surgery at Chicago, Illinois. He died August 28, 1940, in Brookings, South Dakota, of acute appendicitis.

JOHN B. WALTON, age 59, Martin, South Dakota, died in Rochester, Minnesota, January 21, 1941.

*J. E. TRIERWEILER, age 52, Yankton, South Dakota, died April 17, 1941, after an illness of several months. Dr. Trierweiler was graduated from the Creighton College of Medicine at Omaha, Nebraska, and he practiced in Yankton, South Dakota, from the year 1914 until the time of his death with the exception of two years spent with the medical corps of the Army in France.

EDWIN T. RAMSEY, age 64, Clark, South Dakota, died in a Watertown hospital the 12th of May. Dr. Ramsey had been in practice in South Dakota for a good many years and was president of the South Dakota State Medical Association in 1907.

*HAROLD E. KELLOGG, age 58, Brookings, South Dakota, died during the latter part of April, 1941, of pneumonia complicated by cardiovascular disease.

*J. L. FOXTON, age 81, veteran Beadle county physician, died of cardiorenal disease during April, 1941.

C. B. KENTON, age 60, Artesian, South Dakota, died in early May, 1941.

CHARLES L. ROLAND, Humboldt, South Dakota, died at his home recently. He had been president of the Sioux Valley Medical Association and a charter member and past president of the Northwest Medical Society.

*GEORGE A. SARCHET, age 66, Mobridge, South Dakota, prominent physician and district surgeon of the Milwaukee Hospital Association, died at the Mobridge hospital, September 21, 1940.

ELI LEWISON, age 66, was born of pioneer parents on the prairies near Vermillion, South Dakota, in 1874. He died at Canton, South Dakota, April 6, 1941, of bronchial pneumonia following influenza. He was a graduate of Luther College, Decorah, Iowa, 1897, and of Rush Medical College, 1903. He began the practice of medicine at Toronto, South Dakota, in 1902, and in 1907 moved to Canton, South Dakota, where he enjoyed a successful practice until 1933, when he suffered a disabling attack of coronary thrombosis. This provided a baffling complication to the disease which caused his demise.

R. J. QUINN, M.D., *Chairman.*

* *Member of association at time of death.*

REPORT OF COMMITTEE ON RADIO

Medical radio broadcasts as sponsored by the State Association were continued weekly from station KSOO in Sioux Falls. It has been at 1:15 each Sunday afternoon and consisted of the reading of a paper on a medical subject. Dialogue was tried and dramatization has been considered, but are not feasible from the standpoint of papers or readers. All papers are read by the Secretary of the Seventh District, Dr. H. R. Hummer, and in his (seldom) absence by Dr. P. R. Billingsley.

The papers are prepared for the most part by the physicians of the Association, and it is the responsibility of the Committee and the State Secretary to have one for each program, as the "show must go on." When physicians stop writing the papers the broadcast shall stop and it is emphasized here that the success of this radio program is the fact that the papers are

written by local men—the listening public want to hear names they know. Let it be urged also that all physicians should realize this and do their part by preparing at least one paper a year, and write it the easy way—not technical—but as you would talk it to your people.

Objection, in a few instances, has been raised because the author is not permitted to read his own paper—and the reasons are that the studio desires the same reader because he perfects himself with time, and the listening public like the same voice.

If the radio program is to be continued, plans are practically complete to expand and have the same papers and the same time from studios in Aberdeen and Rapid City. This means considerable work for the Committee and it is here asked that co-chairmen be named in each of these cities. It shall be their duty to provide a reader and be contact men with their studio, and they shall regularly receive papers from the Chairman or the Secretary.

The Committee too has papers promised from the allied groups—the Auxiliary, state dentists, druggists, hospitals, nurses, training schools and veterinarians, all of which have a distinct place here and shall enhance the program. On Physicians Day the Committee arranged for a radio broadcast by the District Auxiliary, which was in dialogue and was exceptionally good. Also during the Cancer month, the laymen's committee was given the air, and five Sundays were devoted to papers on Cancer. A series of five papers on the development and advance of medicine has just been finished.

Further, a neat announcement of this radio broadcast is to be sent each physician to be hung on the wall or desk for patients to see. Newspaper publicity is difficult to obtain—but whenever a physician can obtain it it should be done and the Committee shall gladly furnish material if desired. Especially would the Committee like to see announcements made in the local newspaper of a forthcoming radio paper written by a physician of that locality.

The studio officials are most enthusiastic with the broadcast and consider it the best of their "free will programs." They always extend to the Committee and the physicians every courtesy and because of their interest in it give most helpful cooperation. The Committee requests the State Medical Association to recognize and officially acknowledge their appreciation to the radio station, and also to Dr. Hummer, our "ace reader", who is most faithful in this duty, and to Dr. Billingsley, who unfailingly "pinch hits" for him. In these two men we are fortunate, because we have two good readers as to constancy, voice and delivery.

The Committee recommends:

1. The continuance of the radio program on KSOO.
2. The inclusion of studios in Aberdeen and Rapid City.
3. That physicians and their families listen.
4. That physicians hang the radio cards in their offices.
5. That each physician write a 14 minute paper (4 sheets).
6. That letters of acknowledgment be sent.

Radio Committee:

WILL E. DONAHOE, M.D., *Chairman*.

REPORT OF ALLIED GROUP COMMITTEE

Officers, House of Delegates, Members of the South Dakota State Medical Association:

Due to the death of Dr. J. O. F. Kraushaar, who was the chairman of this committee, Dr. C. E. Sherwood, secretary, requested me to hand in the report of the Committee on Inter-Allied Activities, and your committee hereby makes the following report: To a certain extent the report of your legislative committee covers the report of our committee because on the whole there has been little work done by our committee aside from its contact with members of the legislature during the last session, wherein we were able to make personal contact with several of the members, and in some cases were able to secure from them active opposition to the Osteopathic bills.

Another feature of the Inter-Allied activities this year is the establishment of the Pierre District Medical Aid Association which includes twelve counties in the western central part

of the state, for the purpose of the FSA health plan. This organization is practically the same as the old FAC except that this organization handles its own funds through its own auditing committee, and it also has a larger assessment per family than the old FAC had.

One other feature of the Pierre experiment is that the fee bill was set a little higher than the old FAC, because the doctors know that they will not receive 100 per cent of the fee bill. For the first month of the Pierre experiment apparently the funds are only covering 66 per cent of the bills submitted.

I wish to quote from a letter received from Mr. George Kienholtz, who is connected with the Pierre District experiment "I do not believe twelve months of operation will prove the correctness of the plan—it must run at least two years to enable the incidence of illness to level itself. It may be, however, that at the end of eight or ten months, a reasonably good estimate can be made of the needs for the coming year—whether that be in the nature of a higher premium, more limited services, or an all-inclusive medical program with correspondingly higher premium."

"It will be interesting to watch the development of this medical aid plan and every effort is being made by the physicians of the Pierre District Medical Society to give the plan a fair trial."

One of your committee men (N. K. H.) visited Fort Wayne, Indiana, last month and as soon as it was mentioned to other doctors there that he was from South Dakota, they immediately began quizzing him concerning the old FAC, and the present Pierre experiment, because the Federal Social Security representatives are trying to put across a similar project in the Fort Wayne district, and are offering the doctors the old South Dakota set-up as having been a marvelous success. The Fort Wayne doctors seem to be very skeptical of the project as offered and regretted that your committee man was unable to be present at one of the meetings when the government men were presenting their sales talk. Your committee man regrets also that he was unable to tell of our past experience before an open meeting of the doctors and government representatives.

The hospital member of our Inter-Allied Council in his letter of May 13, 1941, says: "As to Inter-Allied activities, I would think the one big thing we might try to put over is another Inter-Allied convention for 1942 or 1943. It seems to me the one in Sioux Falls was highly successful and should be repeated." This is just a suggestion and if the House of Delegates thinks a joint convention would be a benefit in 1943 they might offer suggestions along that line to incoming state officers and future Inter-Allied Committee men.

Respectfully submitted,

N. K. HOPKINS, M.D., *Chairman*.

REPORT OF COMMITTEE ON MILITARY AFFAIRS

The duties of the Military Affairs Committee were largely taken over by the Committee on Medical Preparedness. Consequently, the report of this committee is incorporated in the report of the Committee on Medical Preparedness.

WILLIAM DUNCAN, M.D., *Chairman*.

REPORT OF THE COMMITTEE ON MEDICAL PREPAREDNESS

1. The Committee was formed in August 1941 as a component part of the A.M.A. Committee on Medical Preparedness.

2. Assisted in follow-up work on the Medical Preparedness questionnaire which was originally mailed out to each physician from A.M.A. Headquarters—this work has been completed.

3. Chairman attended conference of the A.M.A. Committee with all the State Chairmen in Chicago in September 1940.

4. Chairman conferred with Major Sackett, state Selective Service Medical Director, concerning personnel of Medical Advisory Board.

5. Assisted in preparing a list of physicians who were available, willing and qualified to serve on the two Induction Boards in South Dakota.

6. Requested all District Society Presidents to appoint a District Medical Preparedness Committee—this has been done.

7. Furnished the Corps Area Chairman with several "so-called" confidential reports on Medical Reserve Officers—particularly as to the need for their services in the communities in which they reside.

This Committee took the stand that the need for physicians in South Dakota is as great as any place in the country and that all medical Reserve Officers in South Dakota should have maximum deferment.

8. Is now assisting in preparation of a report by all District Medical Preparedness Committees on what physicians are essential to each District for the care of the civilian population, in the event of a national emergency.

9. Recommended a fee schedule to Selective Service Headquarters.

WILLIAM DUNCAN, M.D., *Chairman.*

REPORT OF COMMITTEE ON SPAFFORD MEMORIAL FUND

The sum of \$25.00, made possible by the Spafford Memorial Fund, is awarded each year to the individual student who, in the opinion of the committee, has made the most progress in Latin, preferably Virgil. Last year the award was made to Ione Gronlund, Volin, South Dakota.

Committee:

J. C. OHLMACHER, M.D., *Chairman.*

REPORT OF COMMITTEE ON MEMORIALS AND RESOLUTIONS

Your Committee on Memorials and Resolutions has reviewed the enclosed records or reports and endorses them with the addition of the name of Dr. C. B. Kenton of Artesian to the report on Necrology, who passed away during the present month.

We also recommend that the South Dakota State Medical Association act with the Women's Auxiliary as an advisory committee only. Such committee to be appointed later.

The Committee also wishes to express the appreciation of the State Association for the cooperation of the Sixth District Medical Society in making this meeting a success.

B. A. BOBB, M.D., *Chairman.*

REPORT OF COMMITTEE ON BENEVOLENT FUND

To the Officers of the South Dakota State Medical Association. Gentlemen:

Your committee, appointed to collaborate with a similar committee from the Ladies' Auxiliary, has to report that a meeting was held in Sioux Falls with representatives of the Ladies Auxiliary and plans for forming a permanent organization under the joint auspices of the South Dakota State Medical Association and the Ladies Auxiliary were discussed. Since then the plans have been further considered by correspondence and a recent letter from Mrs. F. C. Nilsson, Chairman of the Ladies Auxiliary Committee, informs us that the plan we had worked out jointly will be submitted to the Auxiliary at the State Meeting for adoption after which it will be turned over to us to present to the State Medical Association for action.

D. S. BAUGHMAN, M.D., *Chairman.*

REPORT OF COMMITTEE ON REPORTS OF OFFICERS

To the Officers of the South Dakota State Medical Association:

Your Committee on Reports of Officers congratulates the officers and members of the various district societies on their activities and achievements during the past year as revealed in the annual reports of the districts. We want to commend the Executive Committee and the Committee on Arrangements for

the most excellent scientific program and fine entertainment and extend the thanks of the association to the city of Mitchell and to the Sixth District for their cordial hospitality.

D. S. BAUGHMAN, M.D., *Chairman.*

REPORT OF ADVISORY COMMITTEE FOR THE WOMAN'S AUXILIARY

The following are the acts and recommendations:

Oct. 9, 1940—Addressed the Fourth District Medical Auxiliary. Topic, "Socialized Medicine: the Effect it Would Have on the Public."

February, 1941—Wrote a letter to Dr. Wm. Duncan, Webster, S. Dak., Councilor for the Eleventh District, concerning the organization of an Auxiliary in that District.

February, 1941—Wrote a letter to Dr. W. A. George of Selby, S. Dak., relative an organization of the Auxiliary in the Northwest District.

February, 1940—Wrote letters to Drs. N. J. Nessa and C. E. Sherwood of Sioux Falls and Madison respectively regarding ideas they might have regarding the Auxiliary.

March 15, 1941—Sent letter to be read to the meeting of the Auxiliary Board held at Huron, S. Dak., giving my ideas and suggestions relative the activities and future work of the Auxiliary.

Sunday, April 27, 1941—Gave talk to meeting of Doctors and wives at the Auxiliary organization in Mobridge of Northwest District No. 12.

My recommendations are:

1. All wives of doctors should be members of the Woman's Auxiliary.

2. The Auxiliary, as wives and helpers of their husbands, should be in the front line as leaders on all Public Health and Public Relation undertakings.

3. They are in a better position to aid in Medical Social Security work than any lay organization.

4. They should be better informed on all scientific matters coming before laity organization and should be willing and ready at all times to assist in and aid in this important work.

5. The Auxiliary can educate, stimulate, and progress along lines laid down by the American Medical Association, State and local Health Departments, upon psychological, physiological, and sociological problems which we have in every community.

6. They should be better informed and aid in advising the best literature for communities, schools, and programs, and by demonstrations, exhibits, and illustrations do a noble work for the welfare of the doctor and citizens.

7. They can give better information and advice upon legislative laws and community activities if they keep in progress with the medical times.

8. They can help mobilize, stabilize, and unify all medical problems, which we have reason to believe will be a heavy burden upon medicine in the near future.

B. M. HART, M.D., *Chairman.*

REPORT OF COMMITTEE ON CRIPPLED CHILDREN ACTIVITIES

July 1, 1940, to April 30, 1941*

1. Number of clinics	11
Attendance	320
2. Applications received	207
3. New cases authorized	197
Polio	46
Congenital dislocated hips	6
Birth paralysis	1
Club feet	9
Harelip and cleft palate	16
Tuberculosis of bones and joints.....	3
Osteomyelitis	6
Spastic paralysis	2
Scoliosis	2
Burns	3
Deformities due to injuries	19
Strabismus	39

Miscellaneous	45	
4. Total number of authorizations	379	
5. Number of hospital authorizations	276	
6. Number of hospital days	7,107	
7. Hospital fees paid	\$25,928.96	
8. Surgeons fees paid	11,472.38	
9. Amount paid for braces and appliances	3,115.33	
10. Amount paid for transportation and guardian's fees	605.82	
11. Children registered March 31, 1941	1,399	

* Money expended after March 31, 1941, is not included in this report.

G. E. VAN DEMARK, M.D., *Chairman.*

COUNCILOR'S REPORT — SECOND DISTRICT MEDICAL SOCIETY

The first meeting following State Meeting was held September 19, 1940. Guest speakers were Dr. Kerkhof and Dr. Nelson. They gave talks on Coronary Thrombosis and Cardiac Arrhythmus. Business meeting was carried over until next meeting. Seventeen members were present.

November meeting was held on the 14th. Dr. Brown gave a report on delegates' meeting at which time F.A.C. was voted down. Matter of election of councilor came up to the effect that each component Society elect its own councilor. Dr. Brown said no roll call was taken, however. Dr. Brown reported also that State Board of Health would pay \$5.00 for each grade, per doctor, for immunization of school children against smallpox and diphtheria. After discussion it was moved that a committee be given full power in this matter and association abide by their decision. Motion carried. It was moved that money received from State Board of Health for this work be turned over to Society. Motion carried.

Because of inclement weather there was no guest speaker. Nine members present.

December meeting, the annual meeting, was held on the 12th. Election for coming year held. It was moved to have at least three meetings annually with outside speakers. Motion carried. Eleven members present.

February meeting held on the 12th. Dr. N. L. Leven of University of Minnesota, guest speaker, spoke on peritonitis. Dr. Chas. Rea, also of University of Minnesota, used slides and movie films to illustrate various methods of skin graft, especially the technique of new type of skin graft machine. Three visitors present. Fourteen members present.

April meeting held April 9th. The subject of vaccinating for smallpox and inoculating for diphtheria the same day was discussed by several of the members. Dr. Leifson from University of South Dakota discussed the latest theories and discoveries in experimental immunity. He suggested various methods of immunizing for tetanus, typhoid, diphtheria and other diseases, stressing the reaction in immunity, immunistic. A round table discussion followed the talk. Thirteen members, one visitor present.

Letters regarding placement of graduates and referring to nomination of councilor from district No. 2 were read. It was moved that the desired councilor for the district be elected by secret ballot. Dr. Brown was elected by secret ballot as the member desired for councilor from district No. 2.

W. G. MAGEE, M.D., *Councilor.*

COUNCILOR'S REPORT — MADISON DISTRICT NUMBER 3

As Councilor of Madison District No. 3 I have to report as follows:

Since our last annual meeting, the district has held a meeting every two months. All meetings have been well attended and the programs have been interesting. Dr. Gage Clement of Duluth, Minnesota, was the guest speaker on October 4th, and Dr. Cook of Rochester, Minnesota, was our guest speaker on April 29, 1941. By December, 1940, there was a total membership of twenty-six paid-up, active members and two honorary members. All eligible practicing physicians in the district were members of the Society. So far in 1941 twenty-four members have paid their dues, one of whom, H. E. Kellogg, is now

deceased, and there are three honorary members in the district. Dr. C. J. Engelson, for many years an active member, having retired from active practice, was voted an honorary member at our February meeting.

Our District was active in support of legislative activities during the session of the legislature and two of the members made a trip to Pierre.

The District again contributed \$25.00 to the N. P. C. as a body and many of the members made personal contributions besides.

During the year the minimum fee schedule, which had been in force for the past ten years, was revised and at the meeting of April 29, the Society voted unanimously to adopt this revised minimum fee schedule and authorized the Secretary to have copies printed and sent to each member for his guidance.

At the end of the year all expenses are paid and there is a balance in the treasury of \$81.20.

Respectfully,

D. S. BAUGHMAN, M.D., *Councilor.*
Third District Medical Society.

COUNCILOR'S REPORT — FOURTH DISTRICT MEDICAL SOCIETY

During the past year the Fourth District Medical Society has held five meetings at Pierre. At present there are thirteen active members in the District, three physicians who are eligible to membership, and three physicians residing in Pierre, members of the State Health Department, who hold memberships in other district societies.

At our organization meeting on January 24, 1941, the following officers were elected for the year: President—Dr. R. E. Burgess, vice-president—Dr. G. J. Van Heuvelen, Secretary-Treasurer—Dr. M. M. Morrissey, Delegate—Dr. O. A. Kimble.

Practically all our meetings during the past year have been taken up with the organization of a health unit in cooperation with the Farm Security Administration. At this time this unit has been in operation for six weeks and has worked very satisfactorily to date. The essential features of this plan are:

First, that it is limited to Standard Borrowers of the Farm Security Administration;

Second, that it costs each FSA. member \$33.00 a year;

Third, that the District Medical Society has complete charge of the plan. We pay 100 per cent to hospitals, maternity homes, dentists, druggists and nurses. There is an auditing committee of three members of the society who pass on bills each month and dispense funds through a central office located in Pierre.

Fourth: The fee schedule has been kept fairly high so that even if a percentage cut has to be taken each month there is still a fair return for the work done.

On May 1, 1941, there were 395 families enrolled. At present there are 452.

On May 1, 1941, there were bills presented to the auditing committee of \$1,618.88; bills allowed \$1,388.38.

It was very definitely understood among the doctors and with the members that the plan include "emergency medical care" only, and we are holding ourselves definitely to that program.

I am attaching to this report a copy of the agreement with the Farm Security Administration; a copy of our Participation Agreement with the FSA families; a Fee Schedule; and a report by the secretary of the Pierre District Medical Aid Association for May 1, 1941.

C. E. ROBBINS, M.D., *Councilor,*
Fourth District Medical Society.

PARTICIPATION AGREEMENT

..... of, South Dakota, the undersigned, hereby agrees to participate in furnishing emergency medical care and services to the members of the Pierre District Medical Aid Association (hereinafter called the "Association") in accordance with the FSA Health Plan for Armstrong, Haakon, Hughes, Hyde, Jackson, Jones, Lyman, Potter, Stanley, Sully, Washabaugh, and Ziebach Counties, Schedule of Fees (approved and recommended, respectively, by the Inter-Allied Professional Council of South Dakota), attached hereto,

marked Exhibit A and B, respectively, and made a part hereof by reference.

The undersigned understands and agrees that:

1. Five per cent (5%) of each service fee paid to the Association shall be set aside by the Association for administrative expenses and the balance of such fees shall be set aside and used for the payment of bills submitted in connection with the furnishing of emergency medical care and services to the members of the Association. Each month the Association will determine the amount of funds available for the payment of bills for emergency medical care and services for such month. This amount will be arrived at by dividing the service fee of each member (less the deduction of 5 per cent for administrative expenses) by the number of months such fee entitles such member to participate in the affairs of the Association in accordance with the Constitution and By-Laws of the Association. The total of all sums so determined to be available for each member for a given month shall constitute the "monthly fund" which may be disbursed by the Association for the payment of services rendered to its members during the calendar month for which computed. All monies which shall be available as the various "monthly funds" shall be placed in a special deposit account and shall be disbursed only for the purposes for which such money is authorized to be used. The total of all payments for a calendar month shall not exceed the monthly fund for such month. Each monthly fund shall be divided as follows:

Not later than the _____ of each month the individual, corporation or agency furnishing the services will present to the Association an itemized statement of the services rendered and the charge for each item during the previous month. Separate bills will be furnished for each person for whom services are rendered.

All bills rendered shall be submitted by the Association to an Auditing Committee composed of three individuals elected as hereinafter indicated. Such Committee shall have authority to examine and audit all such bills in order to determine whether the charges made are in accordance with the approved Fee Schedule and in order to determine whether the services rendered and charged are for emergency medical care and services as defined in the "FSA Health Service Plan for Armstrong, Haakon, Hughes, Hyde, Jackson, Jones, Lyman, Potter, Stanley, Sully, Washabaugh, and Ziebach Counties." And it shall be the duty of such Committee to disallow any unauthorized charges and to approve, modify, or disallow each of such bills as the facts warrant. Any individual, corporation or agency supplying such emergency medical care and services to a member may request a review of the decision of the Auditing Committee by a Grievance Committee composed of three individuals appointed by the President of the Inter-Allied Professional Council of South Dakota. The decision of such Grievance Committee shall be final.

2. Rules and regulations of the State Department of Health and local Boards of Health are to apply at all times. Wassermann, undulant, typhoid and other laboratory tests, bismuth and arsenicals and any additional services or materials furnished free by state, federal or other agencies shall not be charged against the aforesaid funds. Arrangements will be made, if possible, to approve payments for emergency treatment serum through special Farm Security Administration loans, in emergency cases. The services rendered hereunder will not supplant or duplicate those offered by the state or federal government in special fields, such as veterans' service, care of crippled children, compensation insurance, etc. No charge will be made for material for smallpox vaccination, diphtheria inoculations, intravenous and intramuscular medication for the treatment of syphilis, which will be furnished by a state or federal agency.

3. Each month the Association shall verify five per cent (5%) of the statements rendered by each of the professions, by submitting to the recipients of the service the bill submitted by professionals, and request confirmation of services rendered.

4. Execution of this Agreement and furnishing of emergency medical care and services to the members of the Association entitles the undersigned to one vote in the annual election or direction, or recall and election, of members of the Auditing Committee.

5. Payment of bills as approved by the Auditing Committee or as finally approved by the Grievance Committee in accordance with the provisions of this Agreement and the attachments hereto, shall constitute payment in full for the care and services rendered and fully discharge the Association and the members from any and all obligations therefor. No bills for emergency medical care and services rendered to members of the Association shall be submitted, either in whole or in part, to said members.

Dated at _____, South Dakota, this _____ day of _____, 19____.

(Individual)

(Profession)

(Corporation or Association)

By _____
Title _____
Attest: _____, Secretary.

CERTIFICATE

_____, the undersigned, hereby certifies that he is the duly elected, qualified and acting secretary of the Pierre District Medical Aid Association, and that _____, who executed the within and foregoing Agreement on behalf of such Corporation (Association) was then and there the duly elected, qualified and acting _____ of such Corporation (Association), and that the within and foregoing instrument was duly executed by said _____ in accordance with authority duly conferred on said _____ by the Board of Directors of said Corporation (Association).
(Seal) _____ (Secretary)

_____, the undersigned, the duly elected, qualified and acting _____ of the Pierre District Medical Aid Association, hereby accepts and agrees that said Association shall be bound by the provisions of the within and foregoing instrument, all in accordance with authority duly conferred on the undersigned by the Board of Directors of said Association.
(Seal) Name _____
Title _____

EXHIBIT A

FSA Health Plan for Armstrong, Haakon, Hyde, Hughes, Jackson, Jones, Lyman, Potter, Stanley, Sully, Washabaugh, and Ziebach Counties

The Farm Security Administration, United States Department of Agriculture, will make loans of thirty-three dollars (\$33.00) each, to individuals, who reside in Armstrong, Haakon, Hyde, Hughes, Jackson, Jones, Lyman, Potter, Stanley, Sully, Washabaugh, and Ziebach Counties, in the State of South Dakota, and who are active standard borrowers of the Farm Security Administration, United States Department of Agriculture, eligible for membership in the Pierre District Medical Aid Association (hereinafter referred to as the "Association"), for the purpose of prepaying a year's service fee in such Association. Any member who ceases to be a client of the Farm Security Administration may continue to be a member of said Association.

1. Membership in the Association and prepayment of service fee entitles the member and those individuals in his immediate family and other persons of his household residing with and dependent upon him for support (hereinafter referred to as the "member and his dependents") to receive such of the emergency medical care and services hereinafter set forth, upon the presentation of his membership card to an individual, corporation or agency, authorized to furnish such care and services, in accordance with such agreements as are entered into between such individuals, corporations or agencies, and the Association.

Medicines, medical supplies, dental care, hospitalization or surgery will be furnished only when prescribed and ordered by an attending physician authorized to treat the member in accord-

ance with the provisions hereof. Permission for hospitalization shall be obtained in all cases from the attending physician.

2. Emergency medical care and services shall be deemed to mean and include the following:

- a. Emergency Medical Care shall be limited to the care of acute infections, accidents, hemorrhages, perforations, injuries, obstetrics, strangulations, confinements (including prenatal, delivery and postnatal care) arising or becoming manifest during the term of membership.
- b. Hospitalization shall be furnished only when recommended as necessary to the welfare of the patient, by the attending physician, for selected obstetrical cases, emergency surgical cases, and in strictly emergency medical cases within the categories specified in paragraph numbered "a" above.
- c. Drugs prescribed in connection with the furnishing of emergency medical care shall be A.S.P. and N.F. and drugs accepted by the Council on Pharmacy of the A.M.A., except sera and biologicals which may be obtained from the State Health Department, State of South Dakota. Drugs shall be furnished in connection with emergency medical care only upon the prescription of the attending physician and such prescriptions shall be filled by registered pharmacists.
- d. Dental Care shall include only strictly emergency dental care and, if possible, shall be limited to extractions for the relief of pain and to remedy systemic diseases and simple fillings for children under seventeen (17) years of age. Such care shall not include the furnishing or repair of artificial dentures.
- e. Home Nursing shall be furnished when necessary to the welfare of the patient and upon proper prior authorization by the attending physician. Home nursing shall be performed by registered nurses.

Remedial medical care in connection with chronic conditions existing at the time of an individual's prepayment of service fees to the Association will not be included as emergency care and services except in the case of emergency diagnostic services which are limited to tuberculosis, mental diseases and cancer.

3. Five per cent (5%) of each service paid to the Association shall be set aside and used for administrative expenses and the balance of such fees shall be set aside and used for the payment of bills submitted in connection with the furnishing of emergency medical care and services to the members of the Association, which bills shall be submitted, reviewed and paid in accordance with this Plan and Participation Agreements entered into between the Association and cooperating individuals, corporations and agencies. Such payment shall constitute payment in full for the care and services rendered and no bills for emergency medical care and services rendered under this Plan shall be submitted to or paid by (either full or partial payment) members of the Association.

Continuing demands by a member of the Association for medical care and services not provided for in this Plan shall be adequate cause for cancellation of his membership in the Association and termination of all rights pertinent thereto. Such cancellation shall only be made, after recommendation by the Auditing Committee, by action of the Board of Directors of the Association; provided, that medical care and services not provided for in this Plan may be furnished to members of the Association in accordance with individual private arrangements therefor between the members and the individual, corporation or agency furnishing such care and services.

No bills for emergency medical care and services shall be paid by the Association unless the individual, corporation or agency submitting same has entered into a Participation Agreement with the Association, except when the emergency necessitating the care and services arises outside the area served by the Association, and then only after approval by the Auditing Committee, but in no case shall the fees paid exceed the fees authorized for similar cases arising within the area served by the Association.

4. Emergency medical care and services shall be furnished to members of the Association on the basis hereinbefore set forth, from and after the actual date of the receipt and acceptance by the Association of the individual's Application for

Membership and Participation Agreement and prepayment of service fee hereinbefore provided.

5. This Plan shall become effective on the _____ day of _____, 19____, and shall be operative for a period of _____ () calendar months thereafter and until the _____ day of _____, 19____.

PIERRE DISTRICT MEDICAL AID ASSOCIATION
FEE SCHEDULE

Mileage—25c per mile for each mile traveled.

Obstetrics—\$37.00, in the home, hospital or licensed maternity home. (Including Wassermann and all pre and post natal care.) (The above rates shall apply in all premature obstetrics also.)

General Examination—Office or hospital, including history and minimum laboratory work as necessary—\$3.00. Ordinary office call, or hospital call—\$1.00. House calls, first call any illness—\$3.00; subsequent calls same illness—\$2.00.

Surgery—Minor—\$2.00 to \$15.00.

Surgery—Major—\$50.00 to \$100.00 (graduating from simple or uncomplicated major operation to difficult and complicated major surgery.) (All charges to be supported by narrative statement.)

Fracture Schedule:

Femur	\$75.00
Clavicle	25.00
Patella	35.00
Radius and ulna (shaft)	35.00
Radius or ulna, or Colles'	25.00
Humerus	35.00
Finger	10.00
Toe	5.00
Carpal bones	25.00
Metacarpals	10.00
Pelvis	50.00
Tibia (shaft)	35.00
Fibula (shaft)	15.00
Tibia and Fibula	50.00
Potts'	25.00
Tibia, Internal Malleolus	25.00
Scapula	25.00
Maxillary, inferior (not including dental)	20.00
Nasal bones	10.00
Ribs, single or multiple	\$5 to 10.00
Foot (tarsal bones)	25.00
Metatarsals	10.00

Note: When there is no displacement and no reduction required, the charges shall be 75 per cent of this schedule.

Note: X-rays when necessary, to be added.

Note: Compound or Comminuted, an additional charge of 30 per cent may be added.

Note: Dislocations—25 per cent (one-fourth) less than fracture schedule.

X-ray Schedule:

Ankle joint; arm; clavicle; elbow; foot; forearm; hand; jaw; knee; leg; scapula; shoulder; wrist (two views)	\$ 2.50 each
Chest (plain); hip joint; ribs; thigh	3.75 each
Bladder (with injection); chest stereo; hip joint stereo; kidneys; pelvis; shoulder stereo; sinuses; mastoids; skull; spine (each section)	5.00 each
Gall-bladder	10.00
Gastro-intestinal	12.50
Clysm	7.50
Pyelogram	7.50
Skull, stereo	7.50

Hospital Fee Schedule:

A flat rate of \$4.00 per day shall be paid for patients hospitalized for one week or longer. This shall include room and board, operating room anesthetic, medication, dressings, cast materials, X-ray, physiotherapy, etc.

For patients hospitalized less than one week:

Room and care per day.....\$2.50

Operating room service, not over	5.00
Anesthetic, not over	5.00
Laboratory tests—\$1 each, not to exceed \$5.	
Dressings, drugs, supplies—at actual cost.	
X-rays—as per schedule (above).	
Dental Fee Schedule:	
Emergency extractions, single	\$1.50
Additional	1.00 each
Emergency amalgam fillings, single	1.50
Additional	1.00 each
Drugs:	
Emergency drugs only—at regular rates less 12½%.	
Licensed Maternity Home Fee Schedule:	
Obstetrical cases—a flat rate of \$30.00.	
Other cases—a flat rate of \$3.00 per day.	

Note: Membership privileges in obstetrical cases shall become effective in hospitals and maternity homes from onset of true labor only. Any waiting period expense must be paid by the patient.

Note: Charges for any emergency services not covered by this fee schedule shall be comparable to it and supported by narrative statement.

Note: Dental, hospital, maternity home or nurses services must be authorized in writing by the attending physician. Drugs will be furnished on presentation of special prescription blanks presented in duplicate.

Note: All bills must be presented for payment by the 5th of the following month. This is important. The office, in return, will attempt to have all accounts paid within 10 days, or by the 15th.

REPORT OF SECRETARY

The Pierre District Medical Aid Association began operation on April 1, 1941, and has concluded its first month. The membership fee is \$33 per year and only Standard Borrowers of the FSA are eligible. Its territory embraces 14 counties in central South Dakota which normally flow into one hospital center for major illnesses. Only physicians who have signed the "Participation Agreement" are eligible to file bills for services and all physicians in the 14 counties covered by the Association have signed such agreements. FSA Clients living in surrounding counties may become members—providing they use the facilities of the professions who are living within the limits of the Association.

The attached "Health Plan" explains the limitations of the services to the members and the requirements of the professions who participate.

Fee schedules have been adopted covering hospitalization, maternity home services; drugs, dental work and medical care. Hospital, maternity home, dental work and drugs are preferred claims and are paid in full as per schedule—medical care is scaled down on a basis of funds available for the current month. No services can be rendered by either Hospitals, Maternity Homes, Dentists or Druggists—except on order of the attending physician. Thus a control is obtained by the physicians who have, in a sense, underwritten complete medical care for eligible FSA clients.

Memberships for the first month of operation—April, 1941—were calculated on the basis of 395 families. Inasmuch as the membership fee is \$33 per year, \$1.65 of which is for administrative purposes, the amount released to pay April bills would be 1/12 of \$31.35 times 395, or \$1,031.94. Total bills submitted for the month total \$1,688.88. At this writing the auditing committee, composed of two doctors and the Association Secretary, have not met to audit the bills.

Since May 1, membership applications have been approved, bringing the total membership at this writing to approximately 440 families. The total eligible families in the 14 counties are approximately 1,000.

A review of the bills presented indicates that the heaviest drain on the available funds is from obstetrical cases, the one type of service included in the plan which is not strictly emergent.

My observation of the plan to date is that in order to obtain a true cross-section of the medical care needs of FSA families

membership should be made obligatory. If a membership were made a part of the processing cost of a loan, the same as interest, there would not be the inclination to join only if illness expense was more or less surely anticipated—the Association would then have as members both large and small families. Possibly the best illustration would be the finance plan in purchasing a car. Theft and damage insurance is always included in the finance payments on an automobile.

I do not believe twelve months of operation will prove the correctness of the plan—it must run at least two years to enable the incidence of illness to level itself. It may be, however, that at the end of eight or ten months a reasonably good estimate can be made of the needs for the coming year—whether that be in the nature of a higher premium, more limited service, or an all-inclusive medical program with correspondingly higher premium.

Educational meetings were held in all of the 14 counties before the plan went into effect and the clients themselves were encouraged to ask questions and satisfy themselves as to the medical care they were purchasing for the \$33 premium. They were also told what the plan included and what was not included. They were encouraged to limit their demands for services to the same extent as if they were paying for these services out of their own pockets.

Dental services are being limited as much as possible to emergency extractions—Drugs are being furnished at the regular rate—less 12½ per cent—Hospitalization at a flat rate of \$4 per day if the patient is hospitalized seven days or more—for shorter periods of hospitalization the fee is \$2.50 per day plus \$5 operating room; \$5 anesthetic—supplies at cost—laboratory fees limited to \$5 and X-rays as per schedule which has been set up. The medical fee schedule has been purposely high—as fee schedules go, the general attitude being that if doctors do not place a fair value on their services, nobody else will do so for them. However, under this plan the physicians do not expect to receive 100 per cent of the fee schedule—but whatever the scale-down may be, the participating physicians have agreed to accept as full payment.

It will be interesting to watch the development of this medical aid plan and every effort is being made by the physicians of the Pierre District Medical Association to give the plan a fair trial.

Pierre, South Dakota, May 15, 1941.

Dear Doctor Robbins:

Since writing the attached report on the first month of operation of the Pierre District Medical Aid Association, the auditing committee, composed of two doctors and myself as Secretary, has met, and out of its deliberations, I am able to present the following information:

The Committee ruled:

- Cystoscopies not allowable.
 - Vaccinations and inoculations not allowable.
 - Lumbagos and eczemas which seem chronic—not allowable.
- However the committee did allow bills for first examination, in these conditions.

Memberships on April 30, 1941, totaled 395 families. Amount available for distribution was \$1,031.94.

Bills Presented:		Bills Allowed:
Dentists	\$ 24.00	\$ 22.50
Hospitals	238.00	234.50
Drugs	23.63	23.63
Maternity homes	210.00	180.00
Physicians	1,123.25	927.75
Total	\$1,618.88	\$1,388.38

Respectfully submitted,
GEO. KIENHOLZ, Secretary.

COUNCILOR'S REPORT — SIXTH DISTRICT MEDICAL SOCIETY

Total active paid-up membership—25.
Unpaid inactives total 14.

All of this latter group are eligible for membership so far as I have knowledge. They have all been written to regarding joining the local society on several occasions and have also been

invited to the meetings of the society but a group of 14 eligibles remain as yet for 1941 inactives in our society. In looking over this list of inactives it is interesting to note that with only two possible exceptions the balance of the list consists of names in the older age group, i. e., 70 years—plus or minus. And many of these men are only partially active in the practice of medicine.

About a year ago we of the active society decided upon having every other month during the spring and fall months a meeting beginning at noon and continuing through the evening with dinner. For these meetings we have two outside men who hold dry clinics in the afternoon and present papers with discussions in the evening. Our talent for these meetings has during the past year come from Minneapolis, Omaha, Oklahoma City and other cities closer to Mitchell.

In addition, two meetings are held put on entirely by the local men. These meetings are usually held at the hospitals, alternating between the two.

The attendance at the meetings began fairly good and has been increasing. The meetings have all been very good and the local men have all worked hard together with the hospitals to make them interesting and worth while.

Total district meetings for the past year—six.

Officers of the Society, Sixth District: J. V. McGreevy, M.D., president; L. W. Tobin, M.D., vice-president; R. A. Weber, M.D., secretary-treasurer.

Report submitted by J. H. Lloyd, M.D., Councilor Mitchell District Medical Society.

COUNCILOR'S REPORT — SEVENTH DISTRICT MEDICAL SOCIETY

President—E. S. Stenberg; vice-president—O. C. Erickson; secretary-treasurer—H. R. Hummer; censors—C. E. Culver, G. E. Van Demark, G. E. Zimmerman.

Delegates—G. E. Zimmerman, L. G. Leraan, L. J. Pankow. Alternates—G. A. Stevens, S. A. Donahoe, J. A. Kittleson.

Board of Directors—Three officers, three delegates, three at large P. R. Billingsley, R. Reagan, A. Hyden.

Registered Licensed Physicians in the district	64
Members in good standing May 18, 1941	47
Members in arrears May 18, 1941	6
Members—Honorary	2
Non-members	5
Ineligible	4

Ineligible members are those given to advertising and among the non-members are several in semi-retirement.

The Society holds regular monthly meetings on the second Tuesday of each month with a 6:30 dinner and always a Scientific program with a Clinician from one of the nearby medical centers, and occasionally local talent.

The Board of Directors confer prior to each meeting to consider all business and in turn report and make recommendations to the membership in open meeting.

Attendance runs from 15 to 45 with from 6 to 12 physicians attending from neighbor districts and nearby Minnesota. Interested physicians are kept on the mailing list and sent announcements of all programs.

The Medical Staffs of McKennan and Sioux Valley Hospital contain most of the membership of the Society, and they each hold regular monthly meetings, thereby affording to the physicians of this district three scientific meetings each month.

The Society also endorses the Annual Clinic of the McKennan Hospital staff in which practically all physicians participate and having an attendance last November of 85.

The Society was host in December to the Sioux Valley Medical Association for a most excellent clinical and scientific two-day program with an attendance of 150.

The dues of the Society are \$15.00 annually.

The Seventh District, because of population and location is able to, and does conduct good scientific and clinical programs for the advancement of its membership.

WILL E. DONAHOE, M.D., Councilor.

COUNCILOR'S REPORT — EIGHTH DISTRICT MEDICAL SOCIETY

To the House of Delegates:

The Yankton, or Eighth District, is composed of thirty-six active members; twenty-four non-members, all of whom, so far as it has been possible to check up on them, are eligible for membership. The records show that of the above thirty-six active members, eleven, at the date of this report, are delinquent. There are three on the Honorary Membership list and four Associate Members, a total of forty-three, indicating the membership in all classes of the society. It will be noted that approximately one-third of the members are delinquent in their current year membership dues. It is not known whether this ratio maintains in other districts of the state, but if it does, it indicates one of two things: careless indifference on the part of the individual members to their duties and responsibilities toward organized medicine, or downright economic depression.

If the latter maintains in the southeastern section of the state, it undoubtedly exists elsewhere and perhaps to a greater degree, because it is felt that in the section of the Eighth District, economic conditions should be above the average. Where finances, beyond doubt, are the cause, reducing or wholly remitting the dues for the time being should be considered.

If the delinquency is due to indifference, it is suggested that an awakening of interest in the members to organized medicine should be definitely stimulated. It is felt that more concern and activity in things medical by the profession should be more in evidence, in order that the splendid gains that have been won during recent years be not relinquished. It is important that these gains should be not only maintained but extended and the profession through its organization eventually secure a position of influence equal to that of our neighboring states. This position has not yet been attained, but if we continue in the course we have charted for ourselves, it may be secured. It is therefore urged that delinquencies for the non-payment of dues, which are indeed nominal compared with those of certain other organizations, should be reduced so far as can possibly be done, thus lending proportionate support and interest to our organization. Much has been accomplished in recent years and if we read the signs aright, more will be demanded in the immediate future. Therefore, determined and cooperative organization will be greatly needed.

The Yankton District meets quarterly, setting aside one of its designated meetings for the meeting of the State Association. Hence, three meetings during the year constitute the regular program. Evening sessions are held and the programs are always of value. Men who are specialists and authoritative in their work, usually occupy one or two numbers on the program. These are generally followed by a round table discussion of the subject matter.

Eats usually follow the meetings to tickle the palate and to lend additional justification for the "belly member" to attend the meetings.

The meager attendance at these meetings is definitely lamentable. It is rarely that a 50 per cent attendance is in evidence. It is generally from 10 to 25 per cent and if this situation maintains in other districts of the state, it again indicates lack of interest in self preservation, which should not continue.

The ancient and threadbare idea that the programs, scientific and otherwise, are of little interest and not worth-while, as an alibi, has gathered too much moss at this late date to carry influence in the argument. The habitual absentee manifests a moss bedecked mind underneath which, if one digs a little further, will be disclosed unadulterated selfishness based on the false premises that I haven't the time, Elmer is a good fellow, let him do it. When the cults and other antagonistic elements gain the upper hand, these delinquent absentees may awaken to the fact that there have not been enough Elmers to check the downward slide of medicine.

The absentee member from the make-up of his mental processes can not be in position to appreciate the efforts that the active members of the organization are putting forth to make the practice of medicine in this state what they feel it should be. He should be made to appreciate the fact that this

can not be obtained in any other way than by coöperative effort on the part of the entire profession. Every one should be cognizant, as well as apprehensive, of the inroads that the cults and others are attempting to make against the practice of medicine, as well as against public health, welfare and interest. These subversive activities can be effectively controlled only when there are push power and influence back of that control, obtained by a coördinated and united body of determined members.

The attempt to regiment the practice of medicine with headquarters at Washington; the recurring legislative effort by the cults to nullify what has been accomplished by organized medicine; the out-and-in member hobnobbing with cults; the abortionist with his stool pigeons, a malignant ulcer in many of our communities, and wide-open hospitals coöperating in their activities; the fee splitter, giver and receiver, parasites in the profession, rampant throughout the country; these are all matters which common decency and self-respect in the practice of medicine demand that they be eliminated. Housecleaning measures must come from within and not from without the organized profession.

Respectfully submitted,

Chairman, Board of Councilors.
S. M. HOHF, M.D.

May 6, 1941.

COUNCILOR'S REPORT — NORTHWEST DISTRICT MEDICAL SOCIETY

There are at the present time ten active members in our society. They are the following: W. A. George, Selby, president; J. E. Curtis, Lemmon, vice-president; C. L. Olson, McIntosh, secretary-treasurer; C. E. Lowe, Mobridge, Councilor; A. W. Spiry, Mobridge, delegate; J. E. Curtis, Lemmon, alternate; F. C. Totten, Lemmon; C. E. Duncan, Pollock; R. E. Christie, Eureka; R. M. Catey, Mobridge; M. E. Borsook, Eureka.

We have lost one member during the year, Geo. A. Sarchet, Mobridge, who died in September 1940.

We have at present no honorary members and there is only one physician in the district eligible for membership who is not a member—Dr. T. O. Sandbo of Lemmon. He has been invited to become a member but is apparently not much interested in medical matters, devoting very little time or attention to the practice of medicine.

No physician has moved to Bowdle to take the place of Dr. T. D. Jones who moved to Chamberlain. This adds one more town to the list that formerly had a doctor but now do not. There are not less than six towns in our district having a physician ten years ago that are now without.

During the year three meetings of the Society were held. All were well attended by the membership. At the October meeting Drs. Radl and Larson of Bismarck, North Dakota, were guest speakers. At the April 1941 meeting Dr. Rudolph of Aberdeen gave a very interesting and informative talk on "Injuries of the Eye." President-elect B. M. Hart also spoke on items of interest to the profession.

During the year the Councilor has kept the Society informed on the interests and activities of the Council, being particularly active during the legislative session.

Respectfully submitted,

C. E. Lowe, M.D., Councilor.

COUNCILOR'S REPORT — TWELFTH DISTRICT MEDICAL SOCIETY

The 12th District Medical Society held three meetings during the past year and conducted routine business.

Fourteen members have paid dues for 1941. There are 21 physicians in the District, two of whom are in the Indian Service. Normally we have sixteen members and two more physicians are eligible. Potential full strength—18 members.

One member, Dr. F. L. Stevenson, Webster, moved to Fari-bault, Minn., during the past year.

WILLIAM DUNCAN, M.D., Councilor.

ADDRESS OF THE PRESIDENT

O. J. Mabee, M.D.

Mitchell, South Dakota

To the Officers, Councilors, and Delegates of the South Dakota State Medical Association in session at Mitchell, South Dakota, May 18, 19 and 20, 1941:

I will briefly mention some of the measures that have been brought before the State Legislature since I have been a member of the Council and an officer of the Association. First among these was the Basic Science Bill which was passed in 1938. To date the Basic Science Board has examined 14 applicants, of which 12 have passed. In addition to this, 739 have been certified on the basis of previous licensure immediately after the effective date of the act. Seven have been certified by reciprocal recognition of foreign states' Basic Science certificates. We now have reciprocity with eight states. The board also reports making some progress in the prosecution of "quacks". However, the Board's chief difficulty along this line is in getting the local states' attorneys to coöperate. The doctors of each district should support the Basic Science law by putting enough pressure on their local states' attorney so that he will carry out the suggestions of the Board.

There are several bills which have been brought before the legislature which, if passed, would not only permit the quacks to practice medicine and surgery but would also change our own requirements. Each year the cults endeavor to get bills through which would permit them to do major surgery and to take care of their patients in any hospital which they might wish to patronize. It is needless to comment on the folly of this. I merely wish to bring out here the fact that these groups will put forth ever-increasing pressure to get such bills passed and this can be off-set only by the full coöperation of every doctor in the state, and must not be left to just the officers of the Association.

At this time I wish to commend Dr. Mills and Dr. Cook for their loyalty and their efforts which have been a great help in the situations which have arisen at Pierre. We are fortunate also in having the services of an attorney so capable as Karl Goldsmith, who has probably done more than anyone else in preventing the passage of undesirable bills which have come before the House and Senate.

The Farm Security Administration, coöperating with the Pierre District Medical Aid society, began on April 1, 1941, and has concluded its first month. The membership fee is \$33 per year and only standard borrowers of the FSA are eligible. Its territory embraces 14 counties in central South Dakota which normally flow into one hospital center for major illnesses. Only physicians who have signed the "Participation Agreement" are eligible to file bills for services and all physicians in the 14 counties covered by the Association have signed such agreements. FSA Clients living in surrounding counties may become members—providing they use the facilities of the professions who are living within the limits of the Association.

Fee schedules have been adopted covering hospitalization, maternity home services; drugs, dental work and medical care. Hospital, maternity home, dental work and drugs are *preferred* claims and are paid in full as per schedule—medical care is scaled down on a basis of funds available for the current month. No services can be rendered by either hospitals, maternity homes, dentists or druggists—except on order of the attending physician. Thus a control is obtained by the physicians who have, in a sense, underwritten complete emergency medical care for eligible FSA clients.

Memberships for the first month of operation—April, 1941—were calculated on the basis of 395 families. Inasmuch as the membership fee is \$33 per year—\$1.65 of which is for administrative purposes—the amount released to pay April bills would be 1/12 of \$31.35—times 395—or \$1,031.94. Total bills submitted for the month total \$1,688.88. At this writing the auditing committee, composed of two doctors and the Association Secretary, have not met to audit the bills. Since May 1st, membership applications have been approved—bringing the total membership at this writing to approximately 440 families. The total eligible families in the 14 counties are approximately 1,000. A review of the bills presented indicates that the heaviest drain on the available funds is from obstetrical cases—the one type of service included in the plan which is not strictly emergent.

My observation of the plan to date—is that in order to obtain a true cross-section of the medical care needs of FSA families—membership should be made obligatory. If a membership were made a part of the processing cost of a loan, the same as interest, there would not be the inclination to join only if illness expense were more or less surely anticipated—the association would then have as members both large and small families. Possibly the best illustration would be the finance plan in purchasing a car. Theft and damage insurance are always included in the finance payments on an automobile.

I do not believe twelve months of operation will prove the correctness of the plan—it must run at least two years to enable the incidence of illness to level itself. It may be, however, that at the end of eight or ten months—a reasonably good estimate can be made of the needs for the coming year—whether that be in the nature of a higher premium—more limited services—or an all-inclusive medical program with correspondingly higher premium.

Educational meetings were held in all of the 14 counties before the plan went into effect and the clients themselves were encouraged to ask questions and satisfy themselves as to the medical care they were purchasing for the \$33 premium. They were also told what the plan included and what was not included. They were encouraged to limit their demands for services to the same extent as if they were paying for these services out of their own pockets.

Dental services are being limited as much as possible to emergency extractions—Drugs are being furnished

at the regular rate, less 12 per cent—hospitalization at a flat rate of \$4 per day if the patient is hospitalized seven days or more—for shorter periods of hospitalization, the fee is \$2.50 per day plus \$5 operating room, \$5 anesthetic, supplies at cost, laboratory fees limited to \$4 and X-rays as per a schedule which has been set up. The medical fee schedule has been purposely high, as fee schedules go, the general attitude being that if the Doctors do not place a fair value on their services, nobody else will do so for them. However, under this plan the physicians do not expect to receive 100 per cent of the fee schedule, but whatever the scale-down may be, the participating physicians have agreed to accept as full payment.

The Selective Service Headquarters has given the following information in regard to Medical Doctors:

A. *Supply.* At present it is estimated that there are approximately 155,000 practicing physicians in the country.

B. *Demand.* The national defense program as now outlined will require 7,900 physicians for the Army, 900 for the Navy, 100 for the Public Health Service and 100 for the Veterans Administration, a total of 9,000 medical doctors, *in addition to present staffs.* This represents a reduction of at least 5 per cent in the number of doctors available for service in civilian life. Such a reduction imposes an added burden on physicians serving the general public. The expanding defense program greatly increases industrial hazards to workers and will increase as the national defense program expands, in addition to the 5 per cent withdrawal of physicians from private life to the armed forces under the present program of the armed forces. It has been estimated that the increased demand will be approximately 10 per cent.

C. *Shortage.* From the above it is apparent there is an over-all and increasing national shortage of medical doctors for service both to the armed forces and to the civilian population. Further, the supply is not distributed in accordance with the population, so that consequently there are present shortages in some local board areas while on the other hand there are present surpluses in other local board areas. However, any such surpluses may be substantially reduced and even wiped out entirely by reason of the requirements of the armed forces and the increased civilian requirements as above indicated. As set forth in the Memorandum to all state directors of March 25, 1941, the War Department has stated that it is now in need of medical officers and desires to commission duly qualified physicians and surgeons in the Medical Corps Reserve for immediate active duty of one year. Where a medical doctor, independent of Selective Service, accepts such a commission, he is in Class I-C thus reducing the demand of the Army by one.

D. *Policy and Procedure.* The local board has the problem of deciding whether or not an individual doctor is so necessary to a community that he should be deferred from training and service under the provisions of Paragraphs 350-353 of the regulations. This problem should be approached with a clear appreciation of the

overall national shortage. If the local board determines that he should not be deferred, it should call his attention to the provisions of the above mentioned memorandum and encourage him to apply to the Corps Area Commander for commission in the Medical Corps Reserve. If he has been finally classified in I-A and does not take advantage of this opportunity for commission he will be inducted when his order number is reached.

To complicate matters the request has now come from England for 1,000 American graduates in medicine to report for duty at an early opportunity. The American Medical Association has already set machinery in motion to accomplish this purpose. This, together with a large induction of medical men into the army, and the withdrawal of these physicians from civilian practice, will result in the gravest danger to the country from the standpoint of public health and the needs of medical defense, unless all medical students and those entering medical schools are deferred until completion of their medical studies and internships.

At this time I would like to suggest to the officers of each district society that they try to increase the society membership, and this, I think, could be carried out by endeavoring to put on two or three outstanding programs each year. If enough time and effort is put forth by each district, I am sure they would not only increase their membership, but would also increase cooperation and interest among the doctors already in the society.

I wish to express my appreciation for the splendid cooperation of all the officers and members of the component societies during the past year, and I feel that with continued cooperation the association will be able to accomplish its desired ends.

ADDRESS OF THE PRESIDENT-ELECT

"The Last Stand of the Family Doctor"

B. M. Hart, M.D.

Onida, South Dakota

The Country Doctor, like the village blacksmith, has gone forever. He has played his last tune in the world of service and leaves a monument that will stand throughout Eternity. As far as we older men are concerned, it will make no difference. We have served the people and sacrificed more than we would ask our sons or other young physicians to do. We are on the tail-end of long hard country practices. We have lived to see the general practitioner go from a man of prominence in the community, loved and respected by all, to just an old common Country "Doc". What are some of the reasons for this condition?

1. People have been led to believe that the qualifications and equipment of the Country Doctor are not sufficient to give good medical service; however, the present Country Doctor is graduated from the same type of school, has the same teachers and serves the same internship as the physician of today.

2. Because of the multiplicity of obligations, he has not had as much time as he would like to spend with

his patients, and as a result some details have perhaps been neglected.

3. He has not had the expensive offices or good hospitals in which to do the best kind of work. His clinical faculties (X-ray and Laboratory) have not been adequate.

4. He has not had the support and cooperation from public officers and private organizations in his community.

5. Transportation facilities and good highways have made it possible for persons to travel to larger cities where convenient elaborate examinations can be obtained.

The endeavor of the true physician is to cure sometimes, to relieve often, to comfort always. We, in general practice, have seen sickness in all its phases, we have administered services under the most adverse conditions and obtained reasonable results with little cost to the patient. It is not the high cost of medical care that hurts the public, but it is the high cost of specialization that is breaking the pocketbooks of our sick people. Of course, we know there are cases that require the training and knowledge of specialists, but only about 15 per cent of our patients require this care.

I do not believe that anyone can have too much knowledge upon any medical subject but we cannot all be surgeons or specialists. Three-fourths of us must do the general work of diagnosing, preventing and curing of diseases. Why not give us the opportunity for and privilege of financial returns and credit for doing our work. You might as well take our lives as take from us the means by which we live. I am speaking for the mass of forgotten physicians, the men who are the backbone and the foundation of our medical profession.

The Country Doctor many times makes the diagnosis, takes care of all arrangements for transportation and brings his patient to the hospital where he is not permitted by regulations of hospital and medical staffs to do the work. Here, many times, he loses the future care of his private patient. This is not right and should be remedied. The Country Doctor should be the one to ask the specialist or surgeon to do the work for him. He makes the diagnosis and prognosis and the necessary social and financial preparations. After outlining the case to relatives and friends, and taking the patient to the hospital, he must stand idly by and watch the specialist do the operation or administer the technical procedure on all but country cases where he must do it alone without help.

Statistics show that three-fourths of the physicians of this country are general practitioners. Records also show that there are in the House of Delegates at the American Medical Association four specialist delegates to one general practitioner. Of course, we know this is the fault of the general practitioner, for every Doctor has the right of representation, but we also know that there are many reasons why the general practitioner is not there or represented. We know that the Country Doctor is a private practitioner who many times is alone in the community. When he is gone, the unexpected always happens and he is held responsible for it. He is also,

in many instances, unable to hold his own at such meetings.

One who has spent many long years in study and preparation and has established a well-equipped office should be considered a valuable asset to a country community and should receive the same consideration as a general store well-stocked with the best merchandise.

Are we going to have specialists for the 15 per cent or are we going to have family physicians for the 85 per cent? The pain and suffering is just as bad in a country patient as it is in a hospital patient—are we giving the country case the same care and attention? If not, how are we going to satisfy the people who must live there?

Many of our greatest Doctors were not specialists, men like Osler, Murphy, Senn, Billings, Fenger, Davis and their kind. These men were the roots and trunks of a great tree, not the branch. These men taught in the great fields of practical medicine. They not only taught scientific medicine but altruism and devotion to humanity, medical ethics, sacrifice and service for the general welfare of all humanity, broad, sincere and comprehensive to medicine, the profession and the public.

The city Doctor can choose his own patients from the rich and middle classes; the poor are provided for by charitable organizations and public clinics. The Country Doctor loses the first class and the upper middle class and depends upon his living from the lower brackets of the middle class and the indigents with very small compensation, for few Doctors seldom turn away any patients who are really suffering. If we are to succeed in continuing the field of the family Doctor, we must have better coöperation and mutual sympathy and respect for general practitioners. The branch of the tree is not going to live long if the trunk and roots decay and die.

In many places, health authorities are providing free care and hospital advantages for their citizens, especially in industrial centers and thickly settled places. Rural people are entitled to some of this free scientific knowledge and treatment.

A few weeks ago I had a talk with a prominent professor of the University of Minnesota. He said, "The greatest problem we have today with the medical profession is their indifference to the welfare of their own salvation. They do not take the necessary interest in the live problems which confront their own members in the economical, social, or moral realm." If we are to advance along the lines of the new order of things we will have to wake up to the times. We will have to forget the idea of letting "George do it" and make a desperate and definite effort to lead the public in the new fields of general practice.

In many of our big hospitals the family Doctor is denied position on the staff. He has no place on the faculty in our medical schools. The big clinics are made up of specialized members of the profession. Where then will he take his place except on the outside looking in and no chance to use his services.

Our surgeon general, Thomas Parran, said recently in a talk, "It is not unlikely that Public Health may be our next great social issue in this country." We know that many men, women, and organizations are working on socialized medicine. What medicine needs today is a competent vigilant public health relation committee who can watch and direct the affairs of the medical profession in relation to the public.

At a recent National Health Conference held in Washington, D. C., the President of the United States wired the Organization, "I am glad that the Conference includes so many representatives of the general public." The Doctors present were booed with catcalls when they offered suggestions.

Since the trial of the United States Government and the American Medical Association and its officers, we can expect most any kind of group Health Insurance Organization. There will be governmental support to any new method that opposes organized medicine. Primarily, we are trying to make good medical care available to everyone who seeks it. It is impossible to give every person the best specialized attention just as it is impossible to give every person who seeks it the best clothes, food and luxuries.

We must realize that the present day well-equipped country Doctor should have better compensation than the Doctor of past years who spent only a few years in school and who had only meager equipment. The overhead today is much more. He must furnish this equipment himself for a country practice. The Country Doctor must have more than gratitude for his remuneration, or he falls behind in his ability to meet his obligations. The psychological attitude of the people toward the general practitioner has not progressed with the technical advancement in scientific requirements.

Not long ago, A. Padway, general counsel for the American Federation of Labor, cracked his whip over the profession. "There must be no sabotage on the part of the physicians. They must not sulk. They must not go about with a chip on their shoulders. They must not say 'we dislike the plan.' The physician must see the handwriting on the wall." A short time ago the government spent \$100,000 to investigate the cost of medical care in the United States. The majority of the committee reported that, "The medical profession had failed to give a reasonable service to the patient at a reasonable rate." Why, I wonder. The high cost of expert knowledge was probably the main cause.

Medical schools are urging young Doctors to go to the country, yet they are training them for city practice. They do not give the economical, social, and moral side of Country practice. They do not tell of the hardships, long hours and discouragements. These young men are quick to find out the facts and they go to the cities. I do not blame them. I told my son to do so and he did!

By foul or fair means, the family Doctor is doomed. Is this going to be good for the general public? Will it cause suffering and added expense among country people? If so—what is the remedy? The family Doctor has much to offer in health and happiness.

Communities must do their part to maintain high medical and hospital standards in rural areas. Every community has its different problems to solve. The south is different than the north, the east is different than the west. The people are different. The climate is different. The requirements are different, yet the final results are the same for better health and happiness. This is no local condition, it is a national affair which involves thousands of Doctors and millions of patients. Some authorities have suggested having shorter courses for general practitioners claiming that if they do not do this, the chiropractors and osteopaths are going to take their country places. Shorten, if you will, the course of the man who specializes in some branch and license him only in that branch. This is not the best method by any means, but if the change is to be made, the specialist should be restricted to his specialty.

Where there is no knowledge, the people perish. We must not have inferior men for general practitioners. Their knowledge must be broad and keen if they are to perform the duties of Family Doctors.

Some authorities suggest that we organize a General Practitioners' Society, withdraw from the American Medical Association and make our own laws and reg-

ulations. I hope this will not be necessary. The general public as well as the profession should realize the danger of losing the Family Doctor. He will not be replaced once he has gone from the community in which he has practiced.

It will be our duty as capable medical men to lead, educate and legislate the public to retain the general practitioner as a Family Doctor.

I want to say just a few words about the South Dakota medical men. One-half of the doctors in our state are located in towns of less than one thousand people. The average age of these doctors is fifty-five years. Ten years from now they will be out of practice or should be. Who will take their places if conditions in medicine continue as now?

Danger is everywhere; our duty is now. It will be continuous for many years. We must not make the burden lighter, but make the back stronger to carry the load.

I have just touched the corner of this great field of the general practitioner's life blood; we must till the soil and sow the seeds that will accomplish the greatest harvest for the benefit of all the populace.

SOUTH DAKOTA STATE MEDICAL ASSOCIATION ROSTER -- 1941

Membership by Districts

ABERDEEN DISTRICT No. 1

PRESIDENT	
Keegan, Agnes	Aberdeen
SECRETARY	
Schuchardt, I. L.	Aberdeen
Adams, J. F.	Aberdeen
Alway, J. D.	Aberdeen
Aldrich, H. H.	Wessington
*Bates, W. A.	Aberdeen
Brenckle, J. F.	Mellette
Brinkman, W. C.	Veblen
Bruner, J. E.	Aberdeen
Bunker, Paul	Aberdeen

Calene, J. L.	Aberdeen
Cooley, F. H.	Aberdeen
Drissen, E. M.	Britton
Eckrich, J. A.	Aberdeen
*Freyberg, F. W.	Conde
*Elward, L. R.	Doland
Gelber, R. M.	Aberdeen
Graff, Leo W.	Britton
Keegan, Agnes	Aberdeen
Damm, W. P.	Redfield
King, Owen	Aberdeen
King, H. I.	Aberdeen
Mayer, R. G.	Aberdeen

Murdy, B. C.	Aberdeen
Newkamp, Hugo	Hosmer
Pittenger, E. A.	Aberdeen
Ranney, T. P.	Aberdeen
Rice, D. B.	Britton
Rudolph, E. A.	Aberdeen
Scallin, Paul R.	Redfield
Stephens, E. E.	Eureka
Schuchardt, I. L.	Aberdeen
Whiteside, J. D.	Aberdeen
White, W. E.	Ipswich
Willhite, F. V.	Redfield
†Zachritz, G. F.	Faulton

WATERTOWN DISTRICT No. 2

PRESIDENT	
Brown, H. P.	Watertown
SECRETARY	
Larsen, Myron W.	Watertown
Bates, J. S.	Clear Lake
Bartron, H. J.	Watertown
Brown, H. R.	Watertown
Christenson, A. H.	Clark

Cooper, George	Watertown
Freeburg, H. M.	Watertown
*Hammond, M. J.	Watertown
Larsen, M. W.	Watertown
Johnson, A. E.	Watertown
Jorgenson, M. C.	Watertown
Koren, F.	Watertown
Lockwood, J. H.	Henry
Kenney, H. T.	Watertown
Kilgaard, R. M.	Henry

Hickman, G. L.	Bryant
Maxwell, R. T.	Clear Lake
Magee, W. G.	Watertown
McIntyre, P. S.	Bradley
Randall, O. S.	Watertown
Richards, Geo.	Watertown
Rousseau, M. C.	Watertown
Sherwood, H. W.	Doland
*Tarbell, H. A.	Watertown
Vaughn, J. B.	Castlewood

MADISON DISTRICT No. 3

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Peeke, Alonzo	Volga
SECRETARY	
Baughman, D. S.	Madison
Baughman, D. S.	Madison
Davidson, Magni	Brookings
Drobinsky, Miguel	Estelline
Grove, E. H.	Arlington
Engleson, C. J.	Brookings

Gulbrandsen, G. H.	Brookings
Hopkins, N. K.	Arlington
Jordan, L. E.	Chester
†Kellogg, H. E.	Brookings
Kershner, C. M.	Brookings
Madsen, Mars L.	Canova
Miller, H. A.	Brookings
Mokler, V. A.	Wentworth
Muggly, J. A.	Madison
Peeke, A. P.	Volga

Sherwood, C. E.	Madison
Tank, M. C.	Brookings
Tillisch, H.	Brookings
*Torwick, E. E.	Volga
Torwick, E. T.	Volga
Watson, E. S.	Brookings
Westaby, R. S.	Madison
Westaby, J. R.	Madison
Whitson, G. E.	Madison
Willoughby, F. C.	Howard

PIERRE DISTRICT No. 4

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SECRETARY	
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Burgess, R. E.	Gettysburg
Collins, E. H.	Gettysburg

Creamer, F. H.	Dupree
Embree, V. W.	Onida
Hart, B. M.	Onida
Kimble, O. A.	Murdo
Martin, H. B.	Harrold
Morrissey, M. M.	Pierre
Murphy, Joseph	Murdo

Northrup, F. A.	Pierre
Riggs, T. F.	Pierre
Robbins, C. E.	Pierre
Salladay, I. R.	Pierre
Studenberg, J. E.	Gregory
Triolo, A.	Pierre
Van Heuvelen, G. J.	Pierre

HURON DISTRICT No. 5

PRESIDENT	
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SECRETARY	
Buchanan, R. A.	Huron
Adams, H. P.	Huron

Buchanan, R. A.	Huron
Burman, G. E.	Carthage
Class, F. L.	Huron
*Grosvenor, L. N.	Huron
Gross, D. W.	Woonsocket
Lenz, B. T.	Huron
Saxton, W. H.	Huron

Saylor, H. L.	Huron
Sewell, H. D.	Huron
Shirley, J. C.	Huron
Tschetter, J. S.	Huron
Tschetter, Paul	DeSmet
Wright, O. R.	Huron

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SECRETARY	
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Auld, C. V.	Plankinton
Ball, W. R.	Mitchell
Beukleman, W. H.	Stickney
Bobb, B. A.	Mitchell

Bobb, C. S.	Mitchell
Carrow, R. H.	Fort Thompson
Cochran, F. B.	Plankinton
Bollinger, Wm. F.	Parkston
Delaney, Wm. A.	Mitchell
Dick, L. C.	Spencer
Gifford, A. J.	Alexandria
Gillis, F. D.	Mitchell
Jones, E. W.	Mitchell
Kelley, R. A.	Mitchell

Lloyd, J. H.	Mitchell
McGreevy, J. V.	Mitchell
Mabee, D. R.	Mitchell
Mabee, O. J.	Mitchell
Maytum, W. J.	Alexandria
Reib, W. G.	Parkston
Tobin, F. J.	Mitchell
Tobin, L. W.	Mitchell
Weber, R. A.	Mitchell
Young, E. M.	Mitchell

SIoux FALLS DISTRICT No. 7

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SECRETARY	
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Billingsley, P. R.	Sioux Falls
Billion, T. J.	Sioux Falls
Branden, P. E.	Sioux Falls
Cottam, G. I. W.	Sioux Falls
Cottam, Gilbert	Sioux Falls
*Craig, D. W.	Sioux Falls
Culver, C. F.	Sioux Falls
Dehli, H. M.	Colton
DeVall, F. C.	Garretson
Donahoe, W. E.	Sioux Falls
Donahoe, S. A.	Sioux Falls
Duimstra, Fred	Sioux Falls

Dulaney, C. H.	Canton
Eagan, J. B.	Dell Rapids
Engelcke, R. H.	Viborg
Erickson, O. C.	Sioux Falls
Erickson, E. G.	Sioux Falls
Gage, E. E.	Sioux Falls
Gregg, J. B.	Sioux Falls
Groebner, O. A.	Sioux Falls
Grove, A. F.	Dell Rapids
Hanson, O. L.	Valley Springs
Hummer, H. R.	Sioux Falls
Hyden, Anton	Sioux Falls
Keller, S. A.	Sioux Falls
Kemper, C. E.	Viborg
Kittleson, J. A.	Sioux Falls
Lamb-Barger, Hazel	Sioux Falls
Lanam, M. O.	Sioux Falls
Leraan, L. G.	Sioux Falls
McDonald, C. J.	Sioux Falls

Mullen, R. W.	Sioux Falls
Nelson, J. A.	Sioux Falls
Nessa, N. J.	Sioux Falls
Nilsson, F. C.	Sioux Falls
Opheim, O. V.	Sioux Falls
Pankow, L. J.	Sioux Falls
Parke, L. L.	Canton
*Posthuma, Anne	Sioux Falls
Reagan, Resin	Sioux Falls
*Roberts, W. P.	Sioux Falls
Sercl, W. F.	Sioux Falls
Stenberg, E. S.	Sioux Falls
Stevens, R. G.	Sioux Falls
Stevens, G. A.	Sioux Falls
Stone, J. G.	Montrose
Van Demark, G. E.	Sioux Falls
Volin, H. P.	Lennox
Zellhoefer, H. W. K.	Sioux Falls
Zimmerman, Goldie	Sioux Falls

YANKTON DISTRICT No. 8

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SECRETARY	
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Abts, F. J.	Yankton
Adams, G. S.	Yankton
Andre, H. C.	Vermillion
Ash, J. C.	Lake Andes
Blezek, F. M.	Tabor
Bushnell, J. W.	Elk Point
Bushnell, W. F.	Elk Point

Fairbanks, W. H.	Vermillion
Freshour, Ina Moore	Yankton
Geidt, W. R.	Vermillion
Haas, F. W.	Yankton
Hohf, S. M.	Yankton
Hohf, J. A.	Yankton
Johnson, G. E.	Yankton
Joyce, E.	Hurley
Hubner, R. F.	Tripp
*Kalayjian, D. S.	Parker
*Keeling, C. M.	Springfield
Lacey, V. I.	Yankton

Landman, G. A.	Scotland
Lietzke, E. T.	Beresford
Moore, F. A.	Yankton
Morehouse, E. M.	Yankton
Murphy, J. C.	Yankton
Neisius, F. A.	Platte
Ohlmacher, J. C.	Vermillion
Reding, A. P.	Marion
Smith, A. J.	Yankton
Stansbury, E. M.	Vermillion
†Trierweiler, J. E.	Yankton
Willhite, F. V.	Redfield

BLACK HILLS DISTRICT No. 9

PRESIDENT
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SECRETARY
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 Bailey, S. G. Hot Springs
 Bestgen, Fred P. Rapid City
 Bilger, F. W. Hot Springs
 Butler, J. M. Hot Springs
 *Christian, P. C. Hot Springs
 Clark, B. S. Spearfish
 Clark, O. H. Newell
 *Cramer, L. L. Hot Springs
 Crane, H. L. L'Oyra, Peru
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Protruded Intervertebral Disk*

Some Practical Considerations

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AS recently as five years ago, the protruded intervertebral disk was virtually an unknown lesion. Even those neurologic surgeons who occasionally found one, usually while searching for a suspected spinal cord tumor, had no notion of their frequency nor of their true nature. They were commonly described as neoplastic overgrowths (chondromas) of the intervertebral disks.

Today, the protruded intervertebral disk is generally recognized as a leading cause of intractable sciatic pain, and series of cases numbering in the hundreds have been reported. Unlike some medical "discoveries" which have faded as rapidly as they bloomed, there appears to be no decrease in the number of protruded disks found and successfully treated. There remain, however, certain uncertainties and doubts in the minds of many regarding the diagnostic criteria and proper method of treatment of these lesions. Much of this confusion arises from a tendency to think in terms of the skeletal lesion, the protruded disk itself, rather than in terms of its effect upon the nervous system. The protruded intervertebral disk is an intraspinal tumor, and it presents much the same diagnostic and therapeutic problems as do the neoplastic spinal cord tumors. This is illustrated by the fact that, whereas the first protruded disks removed had been mistaken preoperatively for cord tumors, today, some spinal cord tumors are first diagnosed protruded intervertebral disks.

SYMPTOMS

When the soft central portion (nucleus pulposus) of an intervertebral disk herniates out through a split or tear in the peripheral fibrous ring of the disk, the tumor which results lies in the spinal canal, usually to one side or the other of the midline. An almost constant concomitant of such a lesion is a thickening (hypertrophy) of the ligamentum flavum which joins the two pairs of vertebral laminae which form posterior wall of the spinal canal in that region. This hypertrophied ligament likewise encroaches upon the spinal canal. These two tumors alone are of little clinical significance, for of themselves they produce no symptoms except transitory backache (lumbago) from stretching of the posterior longitudinal ligament during the process of herniation. No serious dysfunction of the spine results from the changes in the intervertebral disk itself. Dramatic symptoms result, however, when a spinal nerve root becomes irritated or compressed by one or both of these protrusions into the spinal canal. In the lower lumbar region, where 95 per cent of protruded disks occur, a protrusion of any size can hardly exist without coming into contact with

one of the roots of the cauda equina as it passes toward the intervertebral foramen through which it will leave the spinal canal. Irritation of such a nerve root will produce that symptom which has become almost synonymous with protruded disk-sciatica. Protrusions at other levels will produce similar root pains in the distribution of the nerve roots at those levels, but since the great majority of protrusions occur in such a position as to bring on sciatic pain, this discussion will be confined to them.

Sciatica from a protruded disk occurs twice as frequently in men as in women, and commonly appears during early adult years, that is, at a time when most persons are engaged in strenuous physical activity. The onset of symptoms may follow a single severe back strain, such as that which may result from lifting a heavy load in a stooping (flexed) posture, or a fall upon the buttocks. In other cases, the normal strains associated with certain occupations, such as riding on locomotives or farm machinery, may lead to a gradual onset of symptoms. Protruded disks are most frequent among those who do physical labor, and among these one must not forget the housewife and the nurse. They also occur in those of sedentary occupation, such as bookkeepers and musicians.

The earliest symptoms of a protruded disk may take the form of attacks of backache (lumbago) brought on by injury or exertion and subsiding rather promptly with rest and strapping. After none, one, or many such backaches, the sciatic pain appears, often with dramatic suddenness. A typical story is that the patient leaned over to pick up a heavy object, felt a "snap" in his back followed by severe pain in one hip and down the back of the corresponding thigh, and was unable to straighten up. A period of rest in bed, together with strapping or physical manipulation of some type often suffices to relieve the pain of the first attack and perhaps of several of those which follow. However, the symptoms of this disease pursue characteristically a relapsing course, each remission of the pain being followed in time by another attack, the attacks becoming more severe with time. Eventually an attack occurs—and it may be the first or the last of a long series—which does not respond to simpler methods of treatment and which renders the patient a chronic invalid.

Several characteristics of the pain of a low lumbar protruded disk are deserving of note. The pain may be confined to the sciatic distribution, that is, down the posterior aspect of the thigh and the lateral aspect of the leg to the ankle, but often there is pain low in the back to one side of the midline, that is in the region of the sacro-iliac joint, with radiation in the sciatic distribution on the same side. Certain actions, such as cough-

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(a) Fig. 1. (b)
Patient with lumbosacral protruded intervertebral disk showing (a) loss of lumbar lordosis, (b) "sciatic scoliosis."

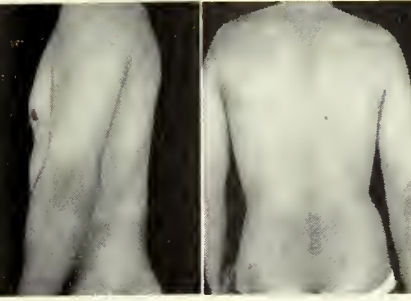


Fig. 2.
The same patient two weeks after operative removal of protruded portion of lumbosacral disk.

ing, sneezing and straining, and maneuvers which put the sciatic nerve on stretch, such as raising the extended leg or bending forward with the knees straight, aggravate the pain. Many patients have their most severe pain at night. Severe bouts of pain may be associated with paresthesia (numbness, tingling) along the lateral aspect of the leg and foot. Examination of the patient during an acute attack of pain may bring out several points very suggestive of the presence of a protruded intervertebral disk. There is usually an obliteration of the normal lumbar lordosis, with the production of a flat back. All motions of the lumbar portion of the spine are restricted by spasm of the erector spinae muscles. The patient is unable to bend forward or to raise his leg without flexing his knees. If this spasm is unequal on the two sides there may result a scoliosis of the lumbar spine, a so-called "sciatic scoliosis" (fig. 1). A particularly significant sign is the production or aggravation of pain radiating down the sciatic distribution by pressure over the interspace between the vertebral spines which overlies the protruded disk. The sciatic nerve is often tender along its course in the thigh.

When the symptoms are particularly acute, any motion of the involved lower extremity will aggravate the pain. Such a patient gets about only with the greatest difficulty and with a considerable limp. Some are confined to bed by the severity of the pain. Only rarely is the involved extremity actually weak, but the patient may favor that extremity to a considerable degree and in time atrophy of moderate amount may develop as a result of disuse.

Since in most instances only a single nerve root is being compressed, neurologic examination will not disclose any striking findings and may be entirely normal aside from those signs which indicate the presence of irritation of the sciatic nerve, such as the Kernig and Lasegue sign, or other maneuvers which put the sciatic nerve on stretch. In about one-half of the cases, the ankle jerk will be reduced or absent on the side of the pain. In those patients who complain of paresthesias an area of reduced sensibility to pain and to touch may be found over the lateral aspect of the lower leg and foot. However, it should be particularly emphasized that the absence of such findings does not in any way militate against the diagnosis of protruded intervertebral disk.

DIAGNOSIS

It is sometimes possible to make the diagnosis of protruded intervertebral disk with a considerable degree of certainty simply upon the history and physical findings presented by the patients, as is illustrated by the following case:

A 36-year-old man was lifting a heavy iron frame above his head while standing in a somewhat stooped position. He felt a sudden sharp pain in the region of his lumbosacral joint. This persisted in spite of manipulative treatment, and presently radiated down the posterior aspect of his left thigh and leg. The pain was aggravated by sneezing or straining, and was at times associated with a tingling sensation in the leg and foot. A few months later he attempted to operate a road grader, but after a few days pain became much more severe and incapacitated him. The patient avoided any use of his left lower extremity. Pressure over the lumbosacral joint produced violent left sciatic pain. The left ankle jerk was absent, and there was a slight loss of sensitivity to pin-prick about the left external malleolus. X-rays of the spine demonstrated a narrowing of the intervertebral space between the fifth lumbar vertebra and the sacrum. A diagnosis of protruded intervertebral disk was made, and the following day a large protrusion of the lumbosacral disk was removed. The patient was immediately relieved of his sciatic pain, and was able to leave the hospital less than two weeks after operation.

In most instances, however, we seek some form of confirmation of our diagnosis before undertaking operative treatment. Plain X-ray studies of the lumbosacral spine will not in themselves reveal the presence of a protruded disk, but they should always be made since they may disclose some other condition which may be accounting for the patient's symptoms. This may take the form of a spinal cord tumor, a tumor of the bone itself, or some inflammatory or hypertrophic reaction in the bone. It may be noted that the narrowing of an intervertebral space is not necessarily associated with a protrusion of the intervertebral disk, but is suggestive of such a lesion.

Similarly the spinal fluid is usually normal in all respects in cases of protruded intervertebral disk, particularly if the fluid is obtained through an interspace several segments above the level of the lesion itself. On the other hand, should an increased quantity of protein be found in the fluid it is very suggestive of the presence of an intraspinal lesion. Thus a patient with a protruded disk may, and often does, have normal X-rays of the spine, normal cerebrospinal fluid and a normal neurologic examination aside from the evidence of irritation

of the sciatic nerve. The only positive preoperative evidence of the presence of a protruded disk is provided by some form of myelography, that is, radiographic visualization of the spinal subarachnoid space. Whereas it was formerly the custom to introduce lipiodol into the spinal subarachnoid space of most of these patients, now only rarely is resort to this measure necessary. Most protruded disks may be demonstrated reasonably well by the use of air myelography, the so-called "spino-gram". This is a much simpler procedure and has the advantage of not leaving behind it a foreign body in the spinal subarachnoid space. The contrast provided by the air is by no means as clear-cut as that provided by the lipiodol, but even a suggestive defect, if coupled with a satisfactory clinical history and examination, will serve to clinch the diagnosis.

TREATMENT

Any discussion of the treatment of protruded intervertebral disks revolves about the question: When shall laminectomy with removal of the protruded portion of the disk be advised? It is evident from the history of many cases that mild attacks of pain, particularly those occurring early in the course of the disease, are often fairly readily relieved by conservative measures, of which rest in bed is the most important. Strapping, extension, manipulation under anesthesia or immobilization in a cast may be beneficial. Some such measures certainly should be tried first in cases with mild symptoms because presumably some cases become quiescent and never require operation. However, when weeks of such treatment lengthen into months without relieving the pain or permitting the patient to return to his employment without aggravating the pain, such measures can no longer be correctly described as "conservative". They are wasteful of time and money, and destructive to the patient's morale. In the presence of severe and intractable pain, operation is the most conservative form of treatment, since it offers prompt and usually permanent relief.

The operation performed for the removal of a protruded intervertebral disk is similar to that performed for the removal of neoplastic intraspinal tumors but has been modified to suit the requirements of this particular lesion. The object of the operation is to decompress the irritated nerve root by removing the ligamentum flavum and the protruded portion of the intervertebral disk which are pinching it, at the same time leaving the patient's back in as nearly normal a condition as possible. Therefore, a small incision centered over the disk is employed and only a minimal amount of bone is removed. Usually this consists of one vertebral spine and its laminae, but frequently it is possible to employ merely a hemilaminectomy, leaving the spines intact and removing the lamina only on the side of the lesion.

After such an operation for removal of an intervertebral disk the patient is allowed freedom of motion

in bed from the start and is able to leave the hospital on the seventh to fourteenth day, depending upon the exact procedure carried out. At the end of two or three months he is allowed to return to his former occupation, whatever it may be.

Spinal fusion may be combined with the laminectomy but this is advised only when other indications, such as spondylolisthesis, are present. Fusion is to be avoided whenever possible since it prolongs the period of hospitalization and disability.

In most instances the patient is free from his sciatic pain immediately after operation and remains so. Indeed, the spectacular relief from severe pain which many of these patients experience is entirely comparable to the dramatic relief which the patient suffering trigeminal neuralgia experiences following section of his fifth cranial nerve.

It is idle, of course, to claim that every patient is completely and permanently relieved of his pain. Failures in the form of partial relief do occur and may be attributed to several causes, of which inadequate operation, that is, failure to decompress the irritated nerve root, is the most obvious. If the patient's pain is the result of an associated arthritis, it will not be relieved by the removal of a protruded disk. Large protrusions which have been present for a long time may set up a traumatic arachnoiditis of the cauda equina with the matting together of its fibers. Removal of such a protrusion may not completely relieve the patient. Occasionally a second protrusion of nuclear matter may take place at the site of removal of the first protrusion, bringing with it a recurrence of the patient's symptoms. Such recurrence may best be prevented by a thorough removal of nuclear matter at the first operation. Finally, it may be noted that patients who are claiming or receiving compensation are relieved less often and less completely than are patients to whom no advantage will accrue from a prolongation of their disability. This situation is not peculiar to patients with protruded intervertebral disks.

SUMMARY

Protruded intervertebral disks in the lower lumbar region are now recognized as a leading cause of chronic, intractable, sciatic pain. Increasing familiarity with the clinical syndrome produced by these lesions permits one to make a diagnosis on clinical grounds alone or with the aid of air myelography in most cases. Mild symptoms are frequently relieved by conservative measures such as bed rest and immobilization of the lower back. In the presence of severe and incapacitating symptoms, or if the patient is unable to resume his occupation without a recurrence of symptoms, operative removal of the protruded portion of the disk and the overlying ligamentum flavum is indicated, since it offers quick, complete, and permanent relief in a high percentage of cases.

Fixation of the Uterus to the Abdominal Wall with Fascial Sutures

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THE surgical relief of the symptoms of prolapse of the uterus demands the reconstruction of the vesicovaginal and rectovaginal musculofascial tissues and upon the union of the levator ani muscles to form a strong perineum. In addition to the repair of these structures immediately surrounding the vagina, some disposition of the uterus is necessary. Procedures of value are: (1) support of the cervix by shortening the uterosacral ligaments and attaching the bases of the broad ligaments in front of the cervix, (2) abdominal suspension of the uterus, (3) interposition of the uterus between the base of the bladder and the anterior vaginal wall, and (4) vaginal hysterectomy. Any one of these

methods may be indicated as the best means of disposing of the uterus in a particular case. The obliteration of the vagina (colpocleisis) is as a rule an admission of defeat. Fixation of the uterus to the anterior abdominal wall occasionally may be the operation of choice. A variety of methods have been used to accomplish this. I wish to describe a technic which, I believe, is simple and will hold the uterus securely.

The peritoneal cavity is opened through the linea alba between the umbilicus and the pubis. The sheaths of the recti are incised at the median borders of the muscles and strips of the anterior rectus fascia, one-half centimeter in width, are cut away near the umbilicus on either

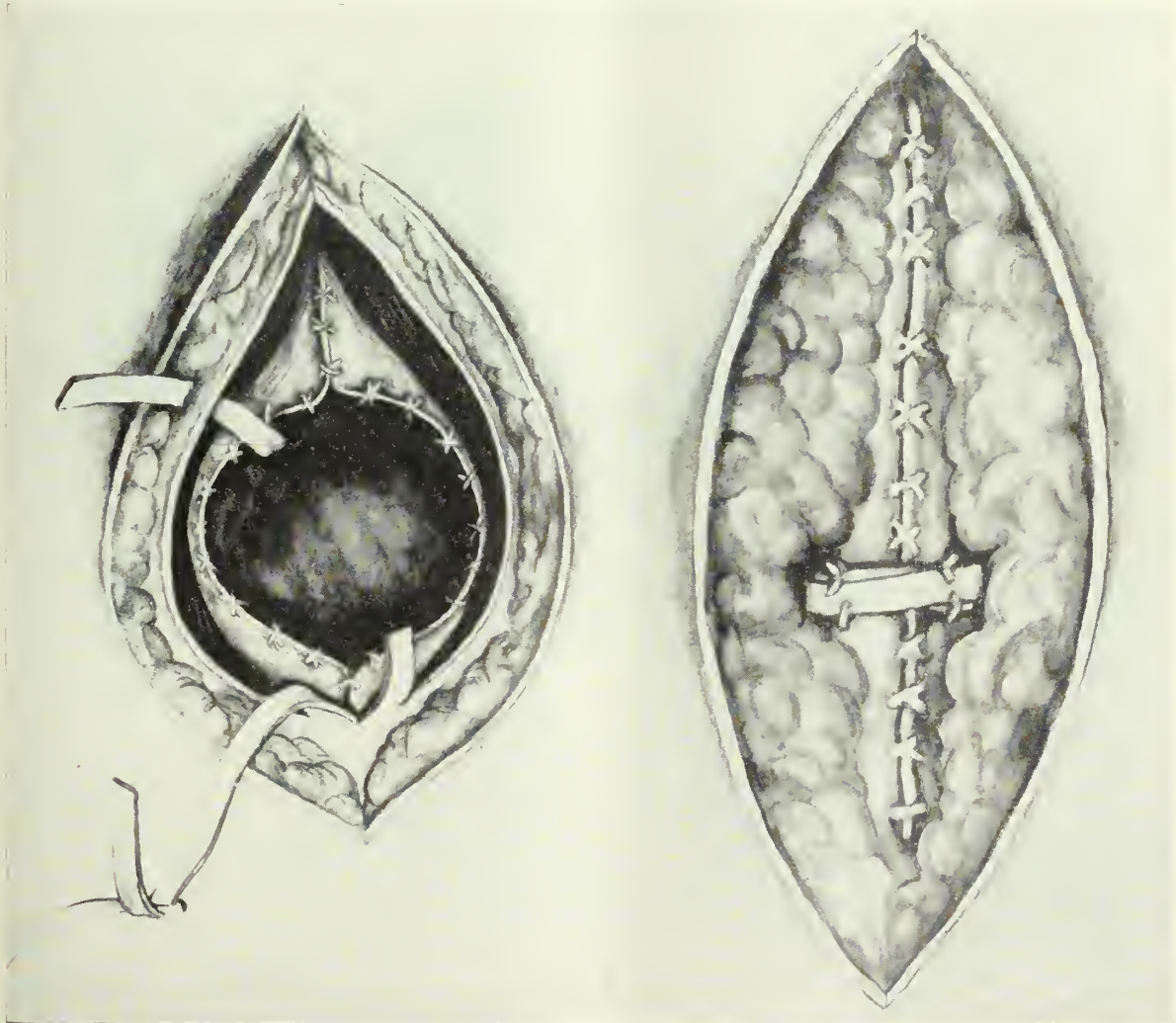


Fig. 1.

Showing strip of fascia passed through uterus and anterior rectus fascia.

Fig. 2.

Showing wound in fascia closed and fascial strips sutured together.

side of the incision and freed well below the area where one desires to fix the fundus. These strips are left attached at the lower angle of the incision (fig. 1). The uterus is lifted up and the peritoneum and posterior rectus sheaths are sutured to it as in the Kocher operation. The remaining wound in the peritoneum and posterior rectus fascia is closed by sutures above the uterus. Each fascial strip is threaded on a fascial needle which is passed obliquely through the wall of the fundus anteroposteriorly and through the anterior rectus fascia

of the opposite side about 2 centimeters from its median edge (fig. 1). The needle should not enter the uterine cavity. The rectus muscles are united down to the uterus and sutured to the uterus just above the line of sutures attaching the peritoneum to the uterus. The fascia is then closed covering the uterus. The fascial strips are tightened, snugging the uterus up to the under surface of the fascia, and then overlapped and sutured together (fig. 2). The subcutaneous fat and skin are closed in the usual manner.

Certain Phases of Nonoperative Treatment of Fractures*

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IN this discussion my remarks will be confined entirely to fractures of the upper extremity. The constant trend in the treatment of fractures is toward open methods. There are, however, as we all know, many fractures well treated by closed or nonoperative methods. By careful use of these methods excellent results may be obtained without the added risk of surgical procedure.

FRACTURES ABOUT THE WRIST

Here two traumatic lesions of importance deserve emphasis, not because there has been any decided improvement in the methods of treating them but because of the fact that the most important part of the handling of these cases is their recognition. These are (1) fractures of the carpal scaphoid bone (fig. 1) and (2) dislocations of the carpal semilunar bone (fig. 2). The first of these presents at times little on local examination except tenderness. There may be a slight amount of swelling and limitation of motion with muscle spasm, but often the localized tenderness is the only sign. The patient complains only of pain on forceful grasping of objects. Carefully taken roentgenograms, particularly in the oblique position to show the extent of the scaphoid bone, will reveal the fracture. If necessary, take a roentgenogram of the opposite wrist to be sure of the diagnosis. Once the diagnosis is established, prolonged fixation of the fracture with the hand in a position of extreme dorsiflexion is done with slight radial deviation and the thumb abducted. The forearm, wrist and hand should be held in this position in plaster of paris, the plaster being carried down to the metacarpophalangeal joints and out to the tip of the thumb.

Dislocations of the carpal semilunar bone are almost always anterior, that is, toward the palmar surface of the

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Fig. 1. Fracture of the right carpal scaphoid bone.

wrist. The concave articular surface usually is the outermost in the dislocated position. Palpation will reveal some thickening and tenderness over the dislocated bone. Swelling is of variable degree. Oftentimes inflammation of the median nerve is set up and becomes very severe, causing great pain and sometimes weakness. This is due to the fact that the close proximity of the nerve to the dislocated bone results in pressure on the nerve with the symptoms noted. The roentgenogram taken in the lateral view is characteristic. Again, if any doubt exists in one's mind about the presence of the dislocation, the same view of the opposite wrist will usually reveal the condition. Reduction in the very early stages can usually be accomplished by manipulation with forceful traction. If there is an accompanying fracture of the radial styloid or other bones, such closed reduction is usually easily accomplished. The difficulty in these latter cases is usually postreduction fixation. Because of the marked relaxation of the joint due to the fractures one must be careful, in applying fixative casts or splints, not to

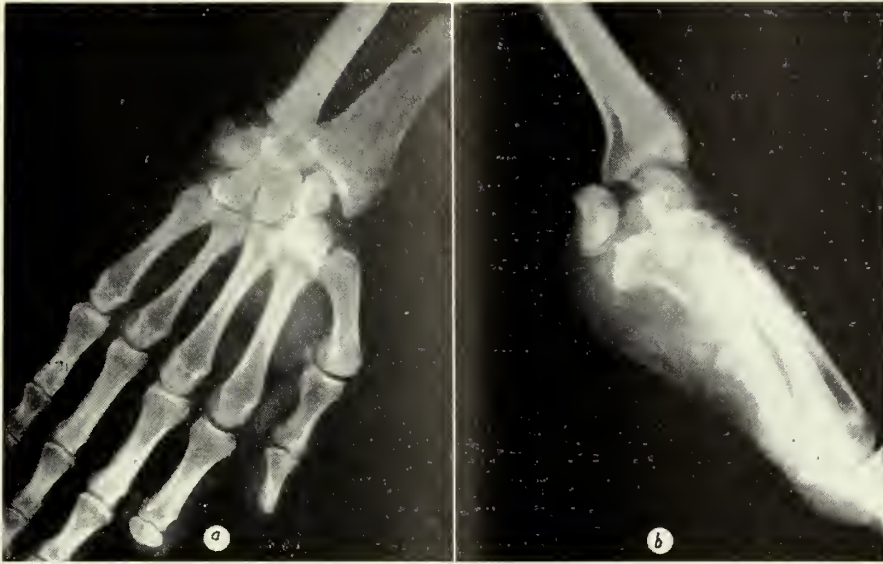


Fig. 2. Dislocation of the left carpal semilunar bone; (a) anteroposterior and (b) lateral.

permit redislocation of the fragments. In simple dislocations open operation is often necessary. If done early enough, open reduction may be accomplished but, as a rule, in the early as well as the later stages removal of the semilunar bone is the treatment of choice.

So far as Colles' fractures are concerned, recognition is usually not difficult. However, even in cases with slight displacement manipulative reduction should be carried out. Fixation, again is important and my colleagues and I prefer the Cotton-Loder position of palmar flexion and ulnar deviation, usually maintained by means of anterior and posterior molded plaster splints.

It is well to encourage the use of the fingers as early as possible in the treatment of Colles' fractures. In this way swelling is prevented and with active use of the fingers prolonged disuse after the retention splints are removed is avoided. Everyone is familiar with the cases of painful disuse atrophy seen after Colles' fractures. It is one of the most annoying complications to be met with in this condition. Early use will often avoid this, but in cases in which it is present after removal of splints the most important part of the treatment is active use on the part of the patient. This must be insisted on by the physician, who will have to exert all his powers of persuasion at times to reassure the patient that no harm will come of such use. In cases in which medico-legal actions are pending the difficulty is greatly increased. The same is true of compensation cases. One must insist on active exercises and follow the patient closely enough to be sure these exercises are carried out. Of less importance in the treatment of these patients are various forms of physical therapy such as heat and massage. Operative treatment has been recommended in these cases, particularly periarterial sympathectomy, but in our experience has not been necessary.

FRACTURES ABOUT THE ELBOW

Of all the regions of the bony skeleton where fractures may occur no group shows a higher percentage of complications than the group of fractures in the region of the elbow. It is only necessary to recall the more frequently seen complications to make one appreciate the importance of these fractures from this standpoint. These complications are (1) ischemic paralysis, (2) traumatic ulnar neuritis, both early and late, (3) traumatic median neuritis, (4) injuries to the radial nerve, (5) myositis ossificans, (6) partial or complete loss of joint motion, and (7) deformity. These are all potential complications in most cases of fracture about the elbow and the diagnostic signs and symptoms of these conditions should be watched for.

Ischemic paralysis is probably the most serious of all these. Its prevention is of utmost importance and can usually be accomplished by avoidance of constricting splints of all sorts and elevation of the arm to prevent swelling. In the presence of severe hemorrhage producing swelling that cannot be reduced in that manner, aspiration of the blood or open reduction with evacuation of the blood clot is justified.

Traumatic ulnar neuritis may be seen early where the ulnar nerve is torn or bruised in the fracture. The close proximity of the nerve to the bone in the ulnar groove makes it particularly vulnerable. It is occasionally damaged in separation of the epiphyses of the internal epicondyle. Late paralysis is more often seen and in these cases it is usually due to hypertrophic changes encroaching on the ulnar groove or enlargement of the size of the bone so that the traction on the nerve when the elbow is in flexion often leads to damage to the nerve due either to adhesions between the nerve and the groove or to enlargement of the bone so that actually the nerve is stretched when the elbow is flexed. Conservative measures in this last group of cases are, as a

rule, not effective and transplantation of the nerve is necessary. In a group of cases of fracture of the humerus which Mroz and I¹ studied, it was found that in eight cases of tardy ulnar palsy the original fracture was of the radial condyle in four cases, of the ulnar condyle in three cases and intercondylar in one case.

Traumatic median neuritis is less frequently seen but may occur in fractures about the elbow. I have had the experience of having the median nerve caught between the fragments in reduction of a supracondylar fracture. Only partial paralysis may result but one must be on guard for this, as open exploration of the nerve may be necessary. The radial nerve is less vulnerable in elbow fractures than in fractures of the shaft of the humerus, but it may be injured either by trauma at the time of fracture or by pressure during reduction or from retaining splints. In unusual cases it may be encroached on by superabundant callus. I have seen one case in which the entire radial nerve was caught by the head of the radius at the time of dislocation. In reduction it was not released but went for several months coiled through the radiohumeral joint around the head of the radius.

Myositis ossificans is a rare complication but unfortunately is seen more frequently about the elbow than about any other joint. Hemorrhage takes place into the muscles and fascial planes about the elbow. For some reason, the blood is not absorbed but becomes replaced by fibrous tissue, which in turn calcifies and often forms actual bone. In such cases the important point as far as treatment is concerned is to delay any attempt at surgical removal for several months until complete ossification of the mass has taken place. Attempts to promote spontaneous resorption of the bone by various means have not met with success.

One of the important and troublesome complications of most fractures about the elbow is postfixation stiffness. Varying degrees of limitation of joint motion may be noted. This is oftentimes a source of anxiety and annoyance to the patient and his relatives. Various types of stretching devices may be used, such as wedging plasters, turnbuckle stretching splints and passive stretching by means of weights or massage. These should suffice in most cases to produce the desired increase in motion. Repeated manipulations under anesthesia are, for the most part, to be discouraged. A joint that is the site of an already well-established traumatic arthritis will only be further injured by such manipulation and oftentimes

harm is done and permanent recovery retarded or even prevented.

FRACTURES OF THE SHAFT OF THE HUMERUS

Fractures of the shaft of the humerus are most often best treated by operative procedures. In many cases, however, comminution may be so severe as to make open reduction out of the question. In such cases as well as in many cases of simple oblique and spiral fractures the arm can be held with traction or by an airplane splint with outrigger attachment and moleskin adhesive traction. Skeletal traction in fractures of the humerus, in my opinion, it to be discouraged, for it is often hard to control, and overpull with the resulting tendency toward nonunion may result. A plaster of paris body cast with fixed traction on the arm may be used instead of the airplane splint. This type of fixation gives a little more rigid support and better fixation though it is less easily adjusted.

One must be on the watch for injuries of the radial nerve in fractures of the middle and lower thirds of the shaft of the humerus. These may be either primary injuries of the nerve incurred at the time of the fracture or secondary injuries due to pressure from manipulation or constricting bands in the fixation apparatus. Both must be carefully watched for; the latter must be avoided if possible.

As a preliminary step in the treatment of fractures of the shaft of the humerus where patients are severely injured or a period of rest in bed is necessary for any other reason, traction in an "outrigger" attachment to the bed is useful. By this apparatus adhesive traction is applied to the humerus and the hand is supported with adhesive traction rope and pulley. By this means fairly satisfactory temporary fixation is accomplished. This apparatus is not suitable for prolonged treatment of such fractures, however.

Conservative types of treatment are applicable to most fractures of the arm, elbow and forearm. The degree of satisfaction with the end results accomplished depends to a large extent on one's attention to details of diagnosis and treatment. Many excellent results can be obtained, however, and as in all fracture treatment, it is attention to such detail that counts.

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A Proposed Simple Method of Determining Clinical Hypersensitiveness in Allergic Patients

A Preliminary Report

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THE inadequacy and drawbacks of skin testing, the leukopenic index, passive transfers, topical application, and other methods used in the diagnosis of atopic allergy are well known. Any method which promises more accurate results, that is simple and inexpensive, and requires nothing from the patient except a small quantity of blood is very desirable.

The test as proposed is based upon certain established facts and observations made by various investigators¹⁻⁵ as follows:

1. The allergic reaction results from the liberation of an endogenous histamine-like substance. This H-Substance is also responsible for anaphylaxis, (and may be derived from either the antigen or the body tissue). Fluid obtained from atopic wheals contains an H-Substance which produces effects similar to histamine.

2. The antigen reacts with the tissue cells which causes the latter to liberate a substance similar, if not identical, with histamine. This freed H-Substance causes dilatation and increased permeability of the capillaries.

3. Under certain circumstances histamine in the blood and its abundance in the eosinophiles is demonstrated.

4. In anaphylaxis from some species of animals there is released from the tissues, *in vivo* and *in vitro*, a substance identical with histamine. Histamine is released from some sensitized animals into the plasma when the antibody contacts the antigen in 100 to 600 per cent.

OBSERVATIONS

An attempt was made to apply to human allergy the positive observations by Katz⁵ of extracting histamine released from the blood cells in experimental anaphylaxis *in vitro* in which he used Code's³ modification of Barsoum and Gaddum's method, and assayed the extracts on atropinized guinea pig ileum.

METHODS

The citrated blood from three hay fever patients clinically sensitive to ragweed was incubated with two per cent aqueous extract of short ragweed antigen for fifteen minutes at 38° C. This was extracted by Code's method and the histamine content tested on guinea pig ileum suspended in Tyrode's Solution at 38° C. containing a 1:10 million concentration of atropine in the Schultz-Dale apparatus. In all three specimens a definite contracture was obtained greater than the control. This would be expected based on the average lower histamine content of blood of non-allergic individuals. The blood histamine content of these specimens expressed in $\gamma/100$ cc.* showed respectively 6.0, 5.5, and 8.0.

* γ = gamma or 0.001 mg.

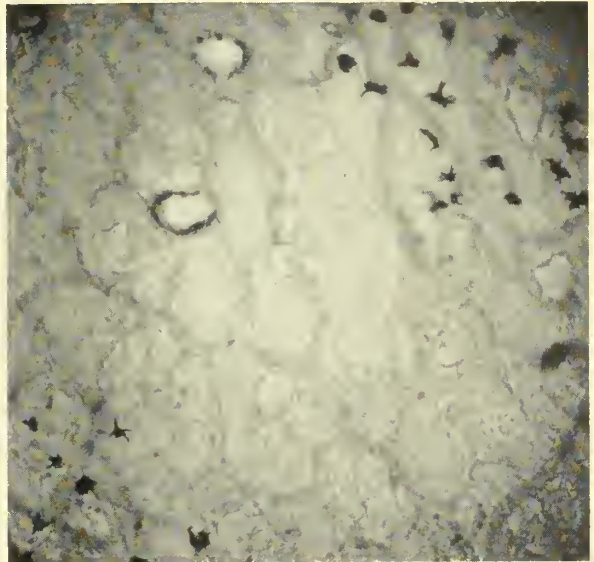


Fig. 1. Low power (150x) photomicrograph of control frog's web. (After five minutes application of one drop of 2 per cent aqueous extract of timothy pollen).

This method was found to be impractical and too elaborate for routine testing. Preliminary correlating observations have been made with this simpler proposed method.

Pithed common frogs (*Rana temporaria*) not more than three inches long, after being allowed to recover from shock, are fastened to a special board in a manner to permit microscopic low power observation of the blood vessels of the foot web. It was found that dilutions of histamine as weak as 1:100 million produced some dilatation of the capillaries. Contracture was observed of the arterioles with stronger dilutions of histamine which slowed the circulation. This was not of great hindrance as there is an earlier capillary response in three to five minutes which is very noticeable. In all of these experiments the solutions were constantly kept at 38° C. as sudden changes in temperature affected the circulation.

The citrated blood from three patients sensitive to ragweed with severe untreated hay fever proven by marked skin reaction, nasal application, as well as passive transfer was incubated at 38° C for fifteen minutes with a two per cent aqueous extract of short ragweed antigen. The plasma was separated by high speed centrifugation and dropped on the frog's web. A definite increase in circulation through the capillaries due to dilatation commenced in about three minutes, reached its maximum in

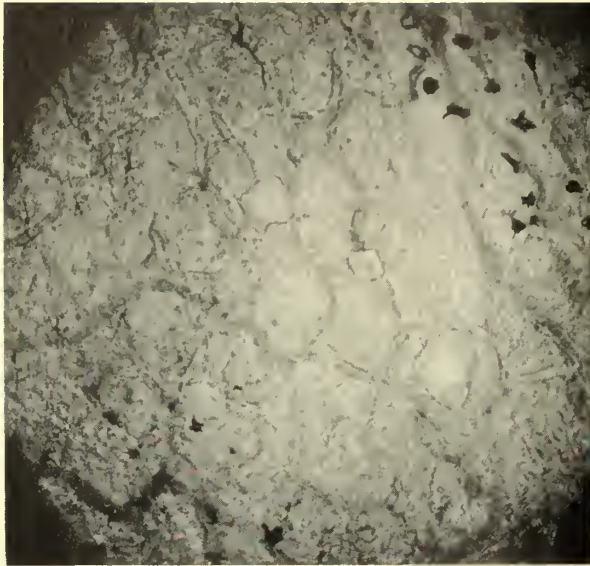


Fig. 2. Same after the addition of 0.002 mg. per 100 cc. of histamine hydrochloride. Disc micrometer measurements show 50 per cent increased capillary dilatation.

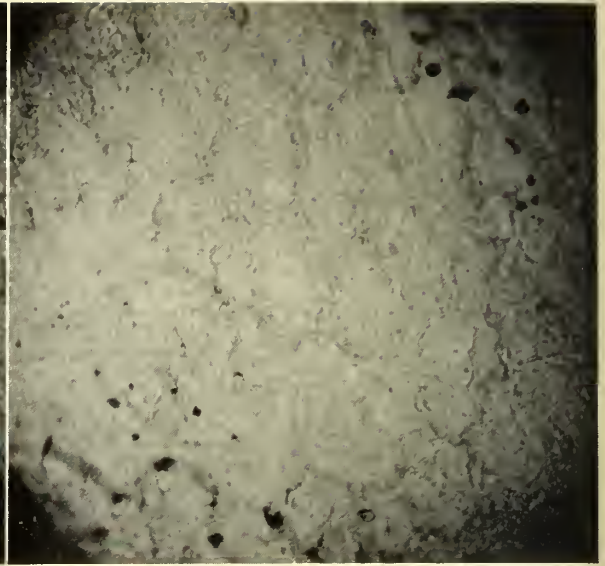


Fig. 3. Same after the addition of incubated citrated whole blood plasma (reagin, antibody) with 2 per cent aqueous extract of short ragweed antigen. Disc micrometer measurements show marked increase of capillary dilatation as well as increase in the amount and rate of flow compared with fig. 2.

five minutes, and remained so for fifteen to twenty minutes.

Since 4 μ /100 cc. was found to be the average histamine content of normal whole blood, this concentration of histamine (.004 mg. to 100 cc.) was first used as a control in these experiments. It was found that this strength produced a definite capillary dilatation in a frog's web in about five minutes of 50 to 100 per cent measured by a disc micrometer) and in order to compare the increased release of histamine in the allergic blood with the normal, it was necessary to dilute the control histamine solution 50 per cent or to 0.002 mg. per 100 cc. to demonstrate a more definite and appreciable increase in the dilatation and flow of blood.

A physiological solution of sodium chloride, distilled water, and an aqueous extract of timothy pollen on a control frog web showed an immediate slight response, but this rapidly subsided. A non-allergic patient's serum from incubated whole blood caused a stronger delayed response (from three to five minutes) but definitely

weaker than the plasma-ragweed extract mixture as shown by micrometer measurements and increased rate of blood flow.

In six cases studied so far, five ragweed hay fever patients and a child with severe eczema due to wheat, there was a definitely greater response compared with the control experiments. Much more work must be done to prove the practical value of this method; however, it is possible that further investigation may establish a simpler and more accurate means of diagnosing the causes of human sensitiveness.

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Relation of the Medical Profession to Selective Service*

Lieutenant Colonel Richard H. Eanes†

Washington, D. C.

I HAVE come before you today with two duties to perform. *First:* I am charged to extend to you the greetings of the Deputy Director, General Hershey, and of the Chief of the Medical Division, Dr. Leonard G. Rowntree. They are fully aware of the great sacrifices that have been asked of you as a profession and of the manner in which you have met all requests. They and their staffs know full well what it has meant to the individual doctor, and it is with sincere admiration and gratitude that we have watched your work. There are some eighteen thousand physicians and nearly seven thousand dentists, a total of approximately twenty-five thousand doctors, working for Selective Service. You are giving of your knowledge, your time, your office space and facilities, without compensation other than consciousness of work well done.—You are making a noble contribution from a noble profession.

Second: It is my desire to convey to you an idea of some of the things as we see them at National Headquarters, that you may gain a broader view and understanding of Selective Service than is possible from the more restricted fields. However, do not feel that you shall get this for nothing. We will exchange ideas; we expect to demand of you, in return, your experiences and advice,—that we may spread all good thoughts for the betterment of the Service as a whole.

For the first time in the history of this Nation it became necessary for Congress and the President to give to us in 1940 an Act to provide enforced military service in time of peace. The Act contemplates the training for a period of a year the physically fit manhood that can be brought rapidly into an intensive training schedule. The Act is purely a defense one and so long as the status quo is maintained, it is contemplated that our present schedule of 1,400,000 men in the Army will be sufficient. It is felt that the time is too short and the task too great to spend time and labor on any except the best men available. This point has been missed by some of our people. The feeling comes to all of us sometimes that the Army is so big that there should be jobs for all sorts of men, and that places can be found for those that we see refused who are apparently fully able to fill some kind of place. True, the Army is large, and there are all sorts of places within its ranks, but for the present only those most fit for general military duty are wanted. The regulations provide that those who do not meet fully the physical requirements of general military service, but who are fit for some service, be placed in a special class, 1-B. They are not lost, but are held in this special class until the need is greater. The time may come when we will need them every one. They may then be inducted and will be assigned where

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†Medical Division, Selective Service Headquarters.

they can best serve. They are fit for limited military service.

There is demand that these 1-B men should be inducted; that they be given treatment for their remediable defects either before induction or by the Army after induction. The thought admittedly merits consideration, but you must bear in mind that the task now in hand is a stupendous one and that to attempt treatment of these men would mean much immediate additional work. In the emergency of 1917-18, these men were inducted. They were assigned to work which they could perform and corrective measures were applied to their remediable conditions when practicable. We may eventually come to this, but for the present the task in hand is all-engaging.

Perhaps it is well that we define what we mean by general military duty. By the term, we mean that when one is fit for such duty, he is able to do any service that he may be called upon to perform; to march with a pack for twenty miles and at the end of the march to engage in a battle, if necessary; to live in barracks with his fellow soldiers caring for himself, and so conducting his barracks life that he is not objectionable to his fellows; to live, if necessary, in camp under trying and uncomfortable conditions without undue complaint of the heat, the cold, or other annoying conditions and ready at all times to respond in a soldierly manner to the demands that may be placed upon him. I believe you will agree that the order is not small, and that the necessity for great care in selecting such men is apparent.

It is for the Army that we are procuring men and therefore, they set the physical standards to be met by the inductees. Selective Service incorporated MR 1-9—the Army's standards of physical fitness—into its regulations, but the standards as prescribed belong wholly to the Army. We cannot change them. Selective Service has, however, the privilege of suggesting changes to the Army, if they seem desirable. I can assure you that there are a number of changes under consideration at present. This is in addition to more liberalized interpretations such as those published recently by the Army in its Surgeon General's Circular Letter No. 26, relative to dental conditions. This particular liberalization is included in Medical Circular No. 2 (dental) from Selective Service which you who are interested will receive in the near future.

Naturally, your greatest interest centers about the question, "What has the operation of Selective Service revealed to us in reference to the physical condition of the Nation?" This question is one that we should answer as soon as possible but no detailed answer is yet available. The occasion for applying the measuring rod is again with us. We must make the most of this opportunity and face whatever it reveals. The physical re-

quirements of this emergency are not very different from those used in 1917-18 and the results can be compared in many respects without discrepancies. We are now requiring some new evidence, serology, on all examinees and, as far as possible, X-rays of the chest.

The figures to date are running almost constant since the beginning of computation. The local boards are finding about 68 per cent fit for general military duty and then induction stations are turning back a little more than 13 per cent. Of the 32 per cent turned down by the local boards, about 20 per cent are rejected for all military duty while 12 per cent are placed in Class 1-B. This means that only 60 registrants out of each 100 physically examined by the local board finally get into the Army. There is no figure as yet available from the Army to show what per cent of inductees are being discharged on certificates of disability for conditions existing prior to induction. That will come later.

Of the conditions which have caused the greatest number of rejections, dental defects lead the list. It is true that our dental standard is rather high, but since we have prided ourselves on having the best dentists in the world we have supposed that our people were more dental-minded than others. It is felt that with the liberalization of dental requirements as mentioned above, there will be a decrease in dental rejections. Already, there have been inquiries at national headquarters as to what should be done with those rejected earlier for dental conditions, prior to the liberalization of interpretation by the Army. Obviously, they should be re-examined and reclassified. If now found to be in 1-A, they should be returned to the induction station for induction. Regardless of the liberalization of regulations, the condition of the mouths of the registrants already examined is a challenge to the dentist and the physician alike. Our youths must be taught more and better dental hygiene.

Next after dentistry comes cardiovascular diseases as causes for rejection. You may recall that during the last war there were so many cardiovascular rejections that a special committee was formed for the purpose of studying the rejections. Many of those studied were found to be suffering from functional conditions only and hence were inducted. We have come a long way and learned much since that time. No longer is a systolic murmur a thing to cause consternation. Instead, the murmur can be more intelligently differentiated. Attention must always be given to enlargement of the heart and to diastolic murmurs. However, our advice is that, if you must err, do so on the safe side. A man rejected now because of organic heart disease can be easily picked up in the future, and, if needed, given opportunity to do his bit. The medical advisory board cardiologist should be called upon freely.

Venereal diseases, in this as in all mobilizations, are playing a major part as cause for rejection. They are being given special prominence at this time because of the serological examinations. In some states, syphilis is running as high as 29 per cent among the negroes and in others as low as 12 per cent. Among the whites

2 per cent represents an average. On the serology evidence alone, and in the absence of demonstrable lesion of the disease, the condition is being diagnosed as latent syphilis. As such, the registrant is not acceptable, but is placed in Class 1-B. Many of our states now are pursuing a most rigid schedule of treatment for syphilis. They are successful in obtaining the treatment of as many as 60 per cent of these men. When men have had adequate treatment, they should be inducted. Many of them will never have their serology reversed and therefore, adequate treatment should be the criterion for induction. Advice is being given to the effect that the regulations should be so changed. It is hoped that this will be brought about in the near future.

It has happened and no doubt will happen again that a man contracting syphilis and receiving treatment enough to reverse his serology or to clear up all local manifestations chances to be inducted. He, through ignorance or by design, fails to inform the Army physicians about his condition. He goes on to a mucocutaneous relapse, which represents the most dangerous syphilitic problem from a public health standpoint. It is not only possible but quite probable that he will spread the disease before he is again put under treatment. You, as physicians and health officers, may have it brought to your attention that someone has been inducted who you know has not received adequate treatment. Since these diseases are reportable, we beg of you to give this information as quickly as possible to the Surgeon of the Corps Area where the man is inducted. This information will then be passed on to the proper surgeon, diagnosis of syphilis will be recorded and treatment given.

Gonorrhoea constitutes a real problem in some places. We have been informed by the health officer of one of our largest cities that infection is for sale in that city for the express purpose of evading training and service under the Selective Training and Service Act of 1940. In other places there appear conditions almost approaching an epidemic. Registrants apparently become infected after they are examined at the local boards and before being brought to the induction station. This is especially true in the rural areas of some of the southern states. The health authorities in these places deny that the infection is for sale as such, but declare that it comes only as a result of too much unwise celebration in preparation for a prolonged absence from the community. The question has arisen as to the best method of handling cases appearing at the induction station with a brand new acute infection. The Army will not induct them for the purpose of treatment. It seems that there is a procedure which is effective and already operating in certain places. It involves an immediate report by all of Selective Service personnel interested and by all induction station commanders to the respective state health authorities. By this means, the case can be gotten under treatment quickly. This is the best practicable solution. With the modern chemotherapy the case can be rendered non-infecting within two or three days and perhaps cured within two weeks. If, after certain tests to prove the cure, it is believed that he has been cured, the selectee

can then be re-presented for induction, accompanied by a certificate showing what has been done for him. Many of the states have laws which are designed in such way that they lend themselves to the proper handling of these cases.

Neuro-psychiatric conditions are another source of trouble. Experience from the last war has made us careful. The true psychoses are generally rather easy to discover and eliminate, but the psychopathic personality of one kind or another is a difficulty. There are not sufficient psychiatrists in this country to properly examine the Army now in mobilization. There are only scattered areas where psychiatrists of proper training can be found in sufficient numbers. In the last war psychopaths were discovered prior to induction in all too insufficient numbers. Some were sent overseas to be sent back as soon as they were put under strain or stress. Others were able to go through and return home after the Armistice to be demobilized and fail utterly in making adjustments in civil life. A benevolent Congress saw fit to view their plight in a most sympathetic manner, and today the taxpayers have paid out money in astounding amounts. They are not through yet for these men are still living and many of them still begetting children. In this connection, Dr. Harry Stack Sullivan has been with us as advisor. He and a committee of psychiatrists have prepared for us Medical Circular No. 1 and with its help many practitioners have been able to gain a better insight into the problem. Conditions are improving but they are still far from satisfactory. Dr. Sullivan is preparing additional psychiatric seminars and hopes to contact more doctors interested in Selective Service. In these times the world seems tinged with madness. Because of the insane lust for power on the part of certain megalomaniacs, mental disease is threatening all races. Fear, an acknowledged potent cause of mental disease, with inhuman cruelty, is being employed deliberately and relentlessly to break down morale, to undermine self-reliance and respect, and to destroy courage. As a destructive weapon, fear has proven as potent, even more effective than force, so that it has become the weapon of choice in some of the countries concerned in carrying on the war of nerves. This nation has failed to solve many of the problems that have been before us for the last decade and more, and now we have upon us a problem by far more difficult than any that has gone before. We need all help possible to destroy the ogre, fear, and to put us in the path of straight thinking and action, to keep us from maladjustments, and to help each to find the place where he can best serve. There are personalities that can get on well in civilian life who, if placed under military discipline and restriction, simply cannot meet the situation. Those personalities are discoverable by the psychiatrists but all of us, whether trained in psychiatry or not, know in our communities youths who have given trouble, not much perhaps, but who have failed to find their rightful adjustment. Do not send them to the Army hoping for their reform. It will not come about and the man will be made worse at a great expense to the Government. You

know these individuals in your community. You perhaps have known their forebears. It is hard at times to turn them back when you and you alone may be the possessor of all the secrets and facts in the case, but it is for the betterment of all that they be turned back. If there is doubt in your mind, send them with a letter of explanation that they may be examined by the psychiatrist on the advisory board or that special attention may be given these individuals by the psychiatrist at the induction station.

Some controversy has arisen over feet that are flat. There are certain types of feet that any orthopedist can describe and which will invariably give trouble. These are easily detected and can be readily rejected. However, there are other flat feet which defy even the best orthopedist to determine whether or not they are troublesome. Some of these will never give trouble if belonging to certain types of individuals, but when a part of other personalities who lack sufficient stamina to carry on, the individual makes capital of them to avoid disagreeable tasks or situations and sooner or later will perhaps use them to avoid military service. Many negroes' feet are anatomically flat. These are not necessarily troublesome but they require a certain amount of study and judgment before being passed on to the induction stations.

For the purpose of visualizing for you what we have to do and what we are doing, we shall present a few slides. This first slide shows our general objective:

Objective: Select an army that will be tops physically, mentally, and morally.

Visualize: 1 year active service, 10 years reserve.

Visualize governmental responsibility from standpoint of:

- Insurance
- Economic security
- Veterans administration
- Lifetime patriotic citizenship.

The second slide shows our procurement objective. This is to be attained from males between 21 and 36 years of age, registered in October, 1940, and from those who may be registered at subsequent times.

CURRENT STATISTICS

1. Total population	132,000,000
2. Number of registrants	16,500,000
3. Estimated number to be physically examined in five years	6,600,000
4. Estimated total number to be inducted in five years	4,400,000
5. Estimated number to be inducted first year	800,000

Incidentally, it is estimated that more than 6,000,000, or about one-third of these, have been classified and about three-fourths of a million have been physically examined. You can see from this that with the present rate of rejections and deferments, we shall not obtain the 4,500,000 men needed from the original registration.

Selective Service has called upon three or more citizens of each community to form boards known as the local board. These boards being familiar with the con-

ditions of the community, and many times knowing the persons to be selected, are above all in best position to judge their neighbors for service in the best interest of the national health, safety, and welfare. These local boards have a tremendous responsibility and upon them rests mainly the success or failure of the whole effort. Each local board, as you so well know, has attached to it one or more examining physicians, medical or dental, to perform for it the necessary physical examinations. This slide (number 3) shows us a few reminders that each examining physician must bear in mind as he makes the examination. These requirements may seem elementary and non-essential, but I beg of you to bear in mind that all examinations must be on a comparable basis in order that regulations may be uniformly applied and statistics properly interpreted. If, in your opinion, based on the physical examination or from personal knowledge, you are convinced that a man will make a good soldier in spite of minor physical defects, so state on the Form 200 and advise his classification as 1-A.

LOCAL BOARD — ESSENTIALS FOR SUCCESS

1. Complete examination — record entry in each blank, including optionals, pulse, blood pressure.
2. Know, adhere to, administer intelligently all regulations.
3. Avoid extraneous influences, personal, political, and emotional.
4. Accept or reject *only* if certain, otherwise refer to Medical Advisory Board.
5. Review each record for physical, mental, and moral defects.

A Class 1-A man who is selected by the local board is forwarded by that board to the respective induction station to fill a part of that local board's quota. In the United States as a whole, just a little better than 10 per cent of men so forwarded have been turned back by the induction stations as not meeting the requirements for general military service. At a glance and without thinking, this looks as though the local boards, by having turned back from the induction stations one out of ten men forwarded, have done a poor job, but not so; there is no reason for criticism when one stops to analyze. We should never expect to get all men to agree on any one point. Doctors must think independently and they will reach different conclusions. If we glance at the next slide we find an analysis of the reasons for a difference between the two examining systems:

ANALYSIS OF REASON FOR REJECTION BY ARMY OF SELECTEES

1. *Local Board:*

Attitude of personal interest.
Desire to fill quota.
Unfamiliarity with regulations and inexperience.
Imperfect examination and incomplete record.
Lack of facilities and personnel.
Recently acquired disqualifying defects (intentional or accidental).
Malingering.

2. *Induction Board:*

Attitude of Army interest.
More exacting.
Experienced (full time), and rigid.
Individual board variation subject to human fallibility, difference in medical judgment.

The local board is activated by a desire to see its community shine in the midst of others; not always has it sufficiently familiarized itself with regulations; it fails to complete its examination record; suffers from lack of proper examining facilities and often the willing doctor is over-worked. Examinees seem to insist upon acquiring new conditions, either accidental or intentional after the examination, and in both of these categories we may find venereal diseases. On the other hand is the attitude of the induction board; we find them standing as guardians of the portals of the Army. There the examination is to be so exacting that none may enter those portals except the physically perfect. That is their sole job. These induction board physicians are subject to human fallibility, difference in medical judgment, and they, too, may err. They have more equipment, better facilities, and are supervised by one with experience in physical examination for armed services. It is natural that they should detect defects and turn back men who have passed their local boards. This is not necessarily a conflict but only challenges each party to study and understand the objective of the other, which after all, is the common objective—of selecting for the armed forces only the men best fitted to serve. It should be realized fully that the examining of men to determine physical fitness for the armed forces is a special branch of medicine; that there are few specialists in this branch; and that such specialists cannot be trained in so short a time since the passage of the Act. Give us time and all will be well.

We shall now approach a subject which is of interest to every one of us. I refer to medical personnel and any of the figures that I may quote have been verified by sources other than medical. There is an over-all shortage of doctors in the country. Distribution is poor. In a few of the larger metropolitan areas there may be a surplus, but in the vast rural areas of the country shortages exist everywhere. Under the present schedule the Army expects to withdraw from the civilian profession 7,900 men. About 3,800 men are needed each year to replace the normal attrition in the profession. There are graduated into the profession each year approximately 5,000 doctors. This leaves us about 1,200 to replace retirements and care for increasing needs. This will leave us with a chronic deficit in civilian life of at least 6,700 doctors. The supply, we are informed, cannot be augmented and we know that this is true during the next five years, for there are just so many pre-medical and medical students now in process of preparation. In these figures, there is no estimation for the increased needs of an expanding Navy, Public Health Service, Veterans Administration, industrial organizations and demands of Selective Service. It means that this shortage of 6,700

doctors plus those needed by other services must be borne by the nation as a whole. We can see from this that we cannot afford to lose or misuse one single doctor. This fact has been recognized by national headquarters of Selective Service, and on April 30 and May 2, information was furnished to the state directors of Selective Service emphasizing the seriousness of the situation and stating specifically that national headquarters feels that it is of paramount importance that the supply be maintained.

There is no limit to the number of commissions available to qualified doctors in the Medical Corps Reserve of the Army. The Army is anxious to build up a pool of Medical Reserve Officers which will take care of their needs throughout the emergency. We are informed that they expect to have completely consumed their present pool by October of 1942. It is felt that doctors in the military age who are qualified should secure a commission and prepare to serve their year. The memorandum from national headquarters of Selective Service, issued on May 2, has stated specifically that if a doctor does not do this and is found to be surplus in his community, there can be no excuse for his deferment—to the contrary, he should be inducted when his number comes up. The War Department, as well as all interested parties, concur that the initial or first internship year is a part of the basic medical education. Young doctors who hold reserve commissions are protected from the operation of Selective Service by that commission and it has been stated, as a matter of policy in the War Department, that young doctors holding commissions and serving their initial internship year will not be called to active duty.

Medical students constitute the whole supply of personnel to the profession. They are not being commissioned in the Medical Corps Reserve and are subject to the operations of Selective Service. Group deferment was denied them by the Act and Selective Service has opposed the Murray Amendment. I shall be glad to state to any of you the reasons for this opposition if you so indicate your desire. In the May 2 memorandum to all state directors of Selective Service, national headquarters stated, "It is of paramount importance that the supply be not only maintained but encouraged to grow and

that no student or intern who gives reasonable promise of becoming an acceptable medical doctor be called to military service, before attaining that status."

The responsibility for deferment lies wholly upon the local boards, subject to review by the appeal boards. It is a question of an understanding of the situation by the local boards.

We are hearing in national headquarters that communities, laboratories, and hospitals are being stripped of their medical workers, interns and residents by such reserve officers being ordered into active military service by the Army. Unquestionably, this is being done to a certain extent, but it is our impression that if a community will make proper representation to the Corps Area Commander, time will be given for some arrangement to be made. In the laboratories and hospitals it will be necessary that older men who have earned a retirement to be enjoyed in normal times will be obliged to return to labor and replace the reserve officers who are called to military service. These are not normal times,—an emergency exists. Each of us must serve where he can function to the best advantage in national defense.

The condition existing in the medical profession likewise exists among the dentists. Selective Service has not yet taken so strong a position on dental students as on medical students, but the need is recognized and a definite statement will be forthcoming in the future. There are Dental Reserve Officers sufficient to meet the immediate needs of the Army. Dentists may request deferment which, if denied them, they can appeal. If, upon appeal, deferment is denied, and they are inducted it is understood they may be commissioned in the Dental Corps Reserve upon application, if they meet the required qualifications.

We, in Washington, have seen no difficulty or controversy that we feel cannot be settled by an understanding between all parties concerned. The success of the Selective Service System depends upon the wholehearted coöperation of the citizens of this great democracy. There are of course rough places to traverse and at times some faint-hearted among us may become discouraged, but our experiences in the past have taught us to persevere and success will be ours.

The American Student Health Association and the Public Health Program

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THE rôle and the inter-relationships of the several fields of public health in the unit or whole should be brought out in the professional education of public health personnel, for the concept of unity and continuity in health work is needed in public health practice.

Let us visualize life as a highway and each of the human beings as automobiles thereon—each human machine moving in one general direction, toward the end of the road. Just how long this highway may be or should be is a moot question. Some place the human life span at 90 years; others think that 120 years are possible. Dublin says: "...though centenarians are sufficiently scarce to attract considerable attention, the hundred mark has here and there undoubtedly been exceeded by a fair margin." The prophet Isaiah may not have missed it far when he proclaimed: "There shall be no more thence an infant of days nor an old man that hath not filled his days for the child shall die a hundred years old."

For the moment, at any rate, let us assume "life's highway" to be 100 mile posts, or *year*-posts, in length; and let us think of public health administration as the highway's chief general traffic-operating agency, concerned with the condition of the thoroughfare (the environment) and interested also in the condition of the many human body-mind-emotion-machines traveling and about to travel thereon.

Efforts toward making the highway (the environment) as safe as possible from more or less environmental factors in disease transmission—including safeguarding water, milk and food supplies; proper disposal of sewage and waste; adequate measures against insects, rodents and so on—have long been of concern to this chief general traffic-operating agency (public health administration). More recently, it has become interested also in the condition and smooth-running efficiency of the human machines themselves. In other words, because the need for directed, systematized efforts toward helping bridge the gap between present-day health-medical knowledge and more general application of it towards better national health is so widespread, the interests of public health administration have been expanding during the last twenty years to include interest not only in environmental health factors but also in better provisions and more readily available opportunities for intelligent attention to many other factors involved in attaining and maintaining sound, vigorous health.

Looking toward maximum expertness and efficiency in general traffic operation on the health "highway"

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we are visualizing, that highway has been apportioned into sections of varying lengths, and sub-operating departments have been established for each of these sections.

Section I, the shortest section, extends only to the first year-post. However, it is a very important section, calling for many activities. The sub-operating department of this section is "Maternity and Infant Hygiene." It is interested in the genesis and fabrication of these new human-machines and in trying to help them get a good start. They need prenatal as well as postnatal attention. They must be tested, adjusted, tuned-up and overhauled at times. Heredity enters into the picture. Eugenics receives too little attention. Many are so poorly fabricated that they must be taken off the highway at the starting line. We call this neonatal mortality. Many others fail to make the first year-post because of poor construction or because of hazards not yet overcome on this section of the road. Infant mortality is still high. Approximately 120,000 infants in the United States failed to reach the first year-post last year (1939).

Child and School Hygiene, the sub-operating traffic department for *Section II* of our road, is interested in these human-machines as they travel from about the second to the eighteenth year-post. This, too, is an exceedingly important section. Today we speak of preschool hygiene. In view of the rapid development of the nursery school movement we may assume that all children now referred to as preschool children will be enrolled in time.

On this second section of our road, school teachers begin aiding parents, public health nurses and other personnel of *Section II*'s sub-operating department. On *Section I*, parents and Maternity and Infant Hygiene personnel, as chauffeurs, steer the small human-machines over that first hazardous section. On *Section II* also, parents, health personnel and teachers serve as chauffeurs at the drive wheels, but on this section, an outstanding job of these health-chauffeurs is gradually to take their hands from the steering wheels and teach each of these rapidly developing body-mind-emotion-machines to begin to drive for itself, aided by habits formed, by example, and by precept, with the advice and help at intervals of trained health mechanics. These "drive your own car" interests are called *health education*.

General public health administration is particularly interested in the nature, quality and quantity of the work done by the sub-operating department of *Section II* (*Child and School Health*). Pope's saying: "'Tis education forms the common mind; just as the twig is bent the tree's inclined," applies as much to health education as to education in general. What is done or is not done

in the public schools of our land is going to accelerate or retard the effectiveness of the modern public health movement as a whole.

Section III of our highway is the longest stretch, running from about the eighteenth year-post to the sixty-fifth—approximately 46 years. The sub-operating department for this stretch is called "Adult and Middle Age Hygiene." There is a trend in some quarters and occupations to dimidiate this section into "Early Adult Hygiene" and "Middle Age Hygiene," each approximately 20 year-posts in length.

The adult period of life, particularly middle age, from about the forty-fifth to the sixty-fifth year-post, is significant in many respects. It is on this stretch that our human-machines carry the chief burdens of the affairs of man—economic, social and political. Here, the body-mind-emotion-machines should be in the best condition possible in order to carry their loads. However, when our human-machines reach this section and are inspected on the middle-age stretch rarely is there found one free from impairments. Here, where their training, experience, and wisdom should mean much to our country and the world, far too many are in condition to give only limited service; far too many break down completely long before they should.

Even among those between the eighteenth and thirty-eighth year-posts there is widespread need for more intelligent attention to health. After a re-analysis of certain findings regarding the prevalence of defects as shown by the World War draft examinations of 1917-1918, according to Rollo H. Britten and George St. J. Perrott, of the Division of Public Health Methods, United States Public Health Service: 21 per cent of those examined were rejected for military service, 31 per cent were classified as not available for general military service (including the rejections), and 52 per cent had one or more recorded defects. (Diseases or defects recorded included orthopedic impairments; eye defects; cardiovascular-renal diseases; underweight; hernia and inguinal rings; tuberculosis, actual or suspected; defective or deficient teeth; nervous or mental diseases; ear defects; venereal diseases; varicose veins, varicocele; goiter; hypertrophic tonsillitis; arthritis and allied disorders; asthma, and so on.)

In its Adult and Middle Age Section the broad trunkway or highway we are visualizing is, or is in the process of being, marked off into several more or less parallel occupational traffic lanes of varying widths depending somewhat on the number of human-machines on or entering these occupational traffic lanes. "Industrial Hygiene" is a general term that is being applied more or less to the interests and activities of the sub-operating traffic department concerned.

The American Student Health Association is in charge of one of these occupational traffic lanes, a comparatively narrow one since comparatively few of our human-machines have the privilege of taking the higher education occupational traffic lane en route to the others. The lane is also a short one, usually only four year-posts long; then the human-machines who take it must leave it and enter other occupational traffic lanes. I wonder

how many of us here today have thought of student health service work as a form of or part of industrial hygiene.

After this third section marked with its occupational traffic lanes, comes *Section IV* of our highway, the last section—the stretch from about the sixty-fifth year-post to the end of the road. As this last section begins, the occupational traffic lane markings seen on the third section fade out. Also, we find that this last stretch is unimproved for the most part. Relatively few reach it and fewer go very far on it; for example, according to a recent mortality table, of 1,000 children 15 years of age, 103 will fail to make the fortieth year-post, and only 462 will pass the seventieth year-post.

Not so long ago, not more than 50 out of each 1,000 infants making the start at birth reached the sixty-fifth year-post. Due to advances in health-medical sciences and to the achievements in human conservation during this century principally by the sub-operating traffic departments on Sections I and II ("Maternity and Infant Hygiene" and "Child and School Hygiene"), 22 or more years have been added to the average length of life. (This is not to be confused with the life span, of course.)

Based on birth rate statistics, it has been estimated that by 1950, 9 per cent of our population will be between the 65th and the final year-posts; and that in the year 2000, sixty years hence, this proportion will be 18.5 per cent. It is no wonder then, that more attention is now being paid to this fourth and last section of the highway.

"Geriatrics" or "Gerontology" are names being applied to the sub-operating traffic department now being established to contribute to Old Age Hygiene—a department which promises increasing opportunities and a worthwhile career for skilled personnel. (I make this observation in case some of you feel frustrated in your present job on the third section.)

You are probably wondering why, in talking to you members of the American Student Health Association, I have spent so much time talking about life as a "highway" and of "sub-operating traffic departments." I have tried to draw a picture, faulty as the picture is, to emphasize the continuity, the unity of the whole health program from start to finish; and to suggest inter-relationships and the partial dependence of the work to be done in one section on the work done in the section or sections preceding it.

Health administrators and health workers should have adequate knowledge of the basic health-medical sciences which underlie all sound health work and they must have training in their special skills, of course. They should coöperate in a balanced program of health interests, activities and services in the "section" or "lane" in which they serve. They should have also a pretty clear idea of the public health program as a whole—of the entire length of our "health road" and of the conservation work going on in its other sections, especially the section preceding their own. Without adequate appreciation of inter-relationships of various health interests and activities within each section concerned and cor-

relation of these interests, and without a concept of the continuity of health conservation, the most effective health work will not be done.

I have pictured the Student Health Service as a sub-operating traffic department on a short higher-education occupational traffic-lane to which the human body-mind-emotion-machines come from the section on which "School and Child Hygiene" serve. I should like to see efforts at better connections between these two sub-operating traffic departments; that is, I should like to see the American School Health Association establish and maintain active working relationships with the health agencies in our public school system. There is need for an earnest joint effort at real coöperation between the American Student Health Association and those in charge of health programs in our public schools, in working out a sound health program which would start in the grade schools and merge with the work carried on in colleges and universities, and with the public health program as a whole.

We find, today, much confusion in respect to school health work. Not long ago a superintendent of one of our city schools came to me for suggestions. He said, "I am looking for a man to head-up our health education program. For the past five years, (he gave me the name of a neighboring city) has beaten us each year in football. Unless I find some man to turn the trick I am going to lose my job."

Recently I made a study of the various interests and activities which have gotten into the public schools or are trying to get in, each having or claiming to have something to contribute to the school health program. There were 14 of these professions or auxiliary services; namely, physician, dentist, nurse, physical educator, health educator, dental hygienist, nutritionist, mental hygienist, physical therapist, and representatives for each of the following interests: tuberculosis, sex education and venereal diseases, accident prevention, conservation of vision, conservation of hearing. The coöperation of the American Student Health Association could do much in helping work out and establish sound, balanced health education, health services and other health conservation and promotion activities for our public schools.

The American Student Health Association should emphasize the importance of all teachers' colleges offering appropriate, sound instruction in hygiene, materials in health education and school health programs. This instruction should be required of teacher-training students.

May I add also that, too often, Student Health Services make little or no effort to correlate their work with the health teaching (general courses in hygiene and community health) or other health conservation and promotion interests and activities carried on within their own "lane". There is some reason for this, of course, but little reason in it.

"Health" activities (termed "physical culture" and later "physical education") were begun in colleges and universities before developments in the health-medical sciences had shown much that is known today regarding health needs. Other interests and activities, some having a direct bearing and others an indirect bearing on stu-

dent health have been added from time to time as more or less independent activities. Correlating these into a sound, balanced, comprehensive, and constructive student health and physical welfare program is proving to be a slow process.

Care of illness and injury is and must be a major concern of the Student Health Service; and the demands for these services usually consume most of its budget and most of the time and energies of its staff. However, a Student Health Service which serves as little more than a dispensary and hospital for ill and injured students is not worthy the name *Student Health Service*. Its interests should include *positive* health interests also, and its work should be correlated with general health education and other student health conservation and promotion interests in the school, the goal of the correlated health program being *positive* health—helping students attain and maintain sound, healthy, vigorous, harmoniously developed, efficient body-mind-emotion-machines; and helping them acquire, too, adequate appreciation of sound health-medical procedures for both individual and community health so far as we know these today, and an active appreciation of the importance of informed, intelligent attention to individual health and to community health not only while in college but in after years as well.

I have been asked to state what contribution the School Physician should make to Physical Education. As I have suggested, he should, with the coöperation of other personnel concerned, help work out and plan a sound, balanced health program in which the various interests and activities concerned with student physical welfare are evaluated, and given due consideration and emphasis. He should appreciate the fact that in Physical Education and Recreation activities, for instance, there are some important interests and objectives other than *health* and recognize their values and place in the physical education program; he should appreciate also that in Health Service work there are or should be health interests and objectives other than attention to illness and injuries; and that the Health Service and Physical Education are laboratory or "doing" aspects of the formal health instruction.

The organization and administration of student physical welfare interests and activities in our colleges and universities—with health education, health services, physical education and recreation activities intelligently correlated in a well-planned, sound, balanced and constructive program, should serve as models along the lines of which the public schools of our country could work out their health programs.

By helping put its own "traffic-lane" in better order through better correlation of student physical welfare interests and activities in our colleges and universities, and by actively coöperating with public school authorities in working out a school health program which would start in our public schools, on Section II of our "highway", and merge with the work in our colleges and universities, the American School Health Association could do much for national health.

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MINNEAPOLIS, MINN., JULY, 1941

MAKE HASTE SLOWLY

Medicine is closely related to social science because both are intimately concerned with the welfare of the human race. In the advancement of each, the other must be carefully considered. It would be short-sighted for either to take steps while ignoring the other. They must go hand in hand to promote lasting success in any new program.

One of the greatest enemies of progress can be ascribed to the tyrannies of established custom, and yet all progress is dependent on the propensities to variation. We must be tolerant, then, of the nonconformist who advocates change in the prevailing usage of our times. We do not here and now take sides in the conflicting attitudes expressed on socialized medicine. That the viewpoint of many high-minded physicians has been undergoing a change in recent years must be apparent to all observers.

When it comes to principles of ethics, the profession cannot compromise, but neither can it ignore the growing demand for an improvement in the distribution of medical care to all our citizens whether it be called by the name of social medicine or not. There must be some way of working this out and still retaining the confidential relations of physician and patient. Organized medicine has done much well-intentioned work in this direction, but annual meetings are far apart and there is an element of danger in delay. On the other hand, there is danger in haste because the individual must do his share of planning.

A. E. H.

DON QUIXOTE?

Are we of organized medicine members of an organized trust, as the attorney general's department maintains we are, to keep inviolate for ourselves a monopoly

on the practice of medicine? Do we oppose the osteopaths in their desire to obtain the right by legislation to practice medicine in all its phases, simply because we do not wish to have a lucrative part of our practice infringed upon as they suggest? Are we indeed motivated in our opposition to the multitudinous legislative and judicial actions that are flooding our state and national bodies today by the quixotic idea that the public must be protected from the ministrations of charlatans as we say? These are just a few of the questions that we today should face squarely and answer to our own satisfaction.

If we are to oppose the further expansion of these sub-standard practitioners into our field, we must do it with logic and reason. If the osteopaths have brought the standards of their schools up to the standards of

ours, let them submit to inspection by a non-sectarian accrediting agency, such as the North Central Association of Colleges. If their training facilities and educational requirements equal those of our schools, then all reason for separate licensing boards will have ceased and a single board should pass on the applicants with no limitations placed on practice. Likewise if the qualifications of foreign graduates can be shown to equal those of ours, they should, upon becoming citizens, be granted the right to practice.

If these practitioners can not be shown to have adequate preparation, the medical profession must continue the fight against a continuous pressure both in our state and national assemblies for their recognition by legislative fiat.

C. E. S.

Book Reviews

Dr. Colwell's Daily Log for Physicians. Champaign, Illinois: Colwell Publishing Co.: 1940. Price \$6.00.

Dr. Colwell's *Daily Log* purports to be a brief, simple, accurate financial record for the physician's desk and accomplishes its purpose. There are various forms for the doctor to use, instructions for which are given with illustrations. There are pages provided for records of inoculations, business summary, expense sheets, personal account, surgical record, narcotics, social security taxes, utility record sheet and appointments. In the back part of the book there is room for record of deaths, annual summary, notifiable diseases and obstetrical waiting list.

In this handy volume, the physician or assistant can record charges, receipts and expenses as well as net profit for the month and for the year. The book should be of inestimable value to the busy physician who appreciates time-saving devices for office detail.

Synopsis of Principles of Surgery, by BERMAN. With 274 illustrations. St. Louis: The C. V. Mosby Company, 1940.

After a brief history of the development of surgery, the author of *Synopsis of Principles of Surgery* takes up the fundamentals underlying a good knowledge of surgery. His first maxim is: "A good surgeon is an internist who performs operations."

A brief synopsis is given of the essentials of surgical pathology, bacteriology and physiology. The process of repair and healing is very masterfully discussed. The cause and process of inflammation is well explained. Miscellaneous infections are discussed as to their origin, pathology, symptoms and treatment.

The author's discussion of the interchange of body fluids is especially interesting in determining the condition of the patient for operation. The determination of blood chlorides and carbon dioxide combining power are important in shock, hemorrhage and other surgical conditions. His discussion of acid base balance is brief and to the point. The determination of acidosis or alkalosis, especially in intestinal obstruction, is important.

The chapter on various tumors and cysts is concise and full of interesting facts. He discusses practically every surgical condition of the body, giving anatomy, pathology, physiology and surgical treatment of each.

This book of about 600 pages is interesting and valuable, especially for the younger surgeon, or as a ready reference book for any surgeon.

Hemorrhagic Diseases, by KAARE K. NYGAARD, M.D., former Fellow in Surgery, the Mayo Foundation; former Assistant Surgeon, the University Clinic, Oslo; Fellow of the Alexander Malthe Foundation for Research in Medicine, Surgery and Gynecology. 320 pages. St. Louis: C. V. Mosby Co.: 1941.

This monograph embodies some recent work, applying the photo-electric principle to mechanisms of velocity of blood clotting. Known hemorrhagic disorders are used as the yardstick for various investigative methods. These in turn are employed as additional aids in the diagnosis and treatment of clinical cases. Part one is devoted to the physiology of clotting and part two to its application in clinical medicine. Neither part is complete, since velocity of the clotting mechanism represents but one phase of the biochemical problem, and its application to hemorrhagic diseases is limited to but few clinical entities. A consideration of hemophilia, thrombocytopenic purpura and hypoprothrombinemia alone does not compromise hemorrhagic disease, as indicated in the formidable title of the book. Obviously there are a great many more bleeding problems resulting from deficiency in one or more of the clotting components—platelets, prothrombin, antithrombin or vascular endothelium. A discussion of typical hemorrhagic disorders is misleading unless the whole gamut is evaluated in terms of the clotting mechanism as a unit. The attempt made by the author is stimulating to investigators in the field of blood coagulation.

Practical Clinical Psychiatry, by E. A. STRECKER and F. G. EBAUGH. Fifth edition, 278 pages. Philadelphia: Blackstone Company.

This book is unusual in that the authors adhere to the method of case presentation in the attempt to clarify and emphasize the symptomatology and the clinical picture presented by the various types of psychoses. Ninety-six separate case histories are cited as examples. With each condition there is given a fairly brief statement covering a discussion, elaboration, and explanation of each of the mental diseases. This style makes for easy reading and for ready understandability. It tends, however, to oversimplify this field of medicine and to sacrifice much of the details and variations in the different forms of psychoses.

The introductory section on psychobiological conceptions has been expanded and is somewhat difficult to follow, probably because of the authors' desire to be so all-inclusive. The book is concluded with a chapter on psychopathological problems of childhood by Dr. Leo Canner of Johns Hopkins. This discussion, although brief, is very comprehensive and well written. In this fifth edition the statistics have been brought up to date, and many of the newer developments have been included, such as electroencephalographic studies in epilepsy and shock therapy in schizophrenia. The bibliography has been enlarged and brought up to date.

Diagnosis and Treatment of Menstrual Disorders and Sterility, by CHARLES MAZER, M.D., F.A.C.S., assistant professor of gynecology and obstetrics, Graduate School of Medicine, University of Pennsylvania; gynecologist to the Mount Sinai Hospital, Philadelphia; and S. LEON ISRAEL, M.D., F.A.C.S., instructor in gynecology and obstetrics, School of Medicine, University of Pennsylvania; associate gynecologist to the Mount Sinai Hospital, Philadelphia; New York: Paul B. Hoeber, Inc.: 485 pages.

This book is written for the general practitioner who sees and treats the great majority of women suffering from menstrual disorders and sterility. With this in mind, the authors state in their preface, more time is given to a detailed description of office procedures employed in the diagnosis and treatment of menstrual disorders and sterility, and a mere mention is made of those procedures which require special technical skill and hospital facilities.

The first two chapters discuss very briefly the anatomy and physiology of the pituitary glands and the ovaries and the physiological changes which take place at puberty in the female. The authors then discuss certain of the more common variations from normal associated with the menstrual cycle, pointing out the probable hormonal factors and the etiology of each and the specific therapy, so far as it is known at the present time. Several chapters are devoted to a discussion of uterine bleeding and its treatment.

Sterility is discussed according to its possible etiology: For example, pelvic lesion, cervical factors, tubal factors, and endocrine factors, as well as the male factor in sterility. Practical information is given on methods of testing for different types of sterility.

The authors have brought together a mass of material in a compact form which will be very useful to the man in general practice. Of necessity they have had to be brief to cover such a large field in a volume of this size. However, this is overcome by the excellent bibliography contained at the end of each chapter. This volume brings together for the busy physician the knowledge in this field which has been sufficiently tried to have practical application. The literature in the field of hormones and their relation to the reproductive function has been so voluminous during the past few years that the average physician cannot hope to keep up with it.

The 1940 Year Book of Urology, OSWALD S. LOWSLEY, M.D., F.A.C.S., editor; anniversary edition, 464 pages, 171 illustrations; Chicago: The Year Book Publishers. Price \$3.

Dr. LOWSLEY, outstanding New York Hospital urologist, is the new editor of this Year Book. The book opens with an excellent special article reviewing six years experience with his unique operative cure of impotence.

The volume is well organized into sections devoted to each portion of the genito-urinary tract, specialized urologic procedures, and a chapter on gonorrhea which includes the more recent therapeutic findings.

With its complete summaries of all important publications related to the field of urology, this book should be of aid to the urologist and to the practitioner interested in the latest phases of this specialty. It is especially valuable for the numerous abstracts of clinical and experimental studies and case reports, many from foreign and non-urologic sources.

It can be recommended as a reference and serves as an index to the many recent advances and present-day opinions in urology.

Handbook of Hearing Aids, by A. F. NIEMOELLER; 156 pages; New York: Harvest House: 1940.

Under thirty-one chapter headings are listed most of the hearing aids now distributed nationally and the manufacturers, with suggestions for choosing. The instruments are classified according to type and their council-acceptance or lack of such acceptance is indicated. Prices are given and opinions as to merit included. The handbook is comprehensive and exhaustive.

Future Meetings

INTERNATIONAL ASSEMBLY

The International Assembly of the Inter-State Post Graduate Medical Association of North America will be held in the Municipal Auditorium of Minneapolis the week of October 13. There will be in the neighborhood of eighty-five distinguished teachers and clinicians from the United States and Canada on the program. Those who have accepted to take part on the program from Minnesota are the following:

University of Minnesota Medical School: Dr. E. T. Bell, Professor of Pathology; Dr. Robert G. Green, Professor of Bacteriology; Dr. Maurice B. Visscher, Professor of Physiology; Dr. John C. McKinley, Professor of Medicine and Nervous and Mental Diseases; Dr. Irvine McQuarrie, Professor of Pediatrics; Dr. John L. McKelvey, Professor of Obstetrics and Gynecology; Dr. Owen H. Wangensteen, Professor of Surgery; Dr. Horace Newhart, Professor of Otolaryngology and Rhinology; Dr. C. Donald Creevy, Assistant Dean and Associate Professor of Surgery and Urology; Dr. N. Logan Leven, Assistant Professor of Clinical Surgery, St. Paul.

The Mayo Clinic: Dr. Alfred Adson, Professor of Neurosurgery; Dr. Walter C. Alvarez, Professor of Medicine; Dr. William F. Braasch, Professor of Urology; Dr. Claude F. Dixon, Associate Professor of Surgery; Dr. Howard K. Gray, Assistant Professor of Surgery; Dr. Charles W. Mayo, Assistant Professor of Surgery; Dr. Paul A. O'Leary, Professor of Dermatology and Syphilology; Dr. Waltman Walters, Professor of Surgery.

On or about the first of September over 100,000 programs will be mailed out to the entire membership of the medical profession in good standing in the United States and Canada.

AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians announces its twenty-sixth annual session, to be held in St. Paul, Minnesota, April 20 to 24, 1942. Dr. Roger I. Lee, of Boston, is President of the College, and will be in charge of the program of General Sessions and Lectures. Dr. John A. Lepak, of St. Paul, has been appointed General Chairman, and will be in charge of the program of Hospital Clinics and Round Table Discussions, as well as local arrangements, entertainment, etc. Mr. Edward R. Loveland, Executive Secretary of the College, 4200 Pine Street, Philadelphia, will have charge of the general management of the session and the technical exhibits. Other medical societies are urged to note these dates in order that conflicts in meeting dates may be avoided for mutual benefit.

News Items

Dr. A. R. Sorenson, Minot, was named president-elect of the North Dakota State Medical association at the 54th annual convention of the group at Grand Forks, May 18-20. Dr. F. W. Ferguson, Kulm, president-elect, became president and Dr. John H. Moore, Grand Forks, was re-elected speaker. Others named include: Dr. Frank Darrow, Fargo, first vice-president; Dr. A. O. Arneson, McVille, second vice-president; Dr. L. W. Larson, Bismarck, secretary, re-elected; and Dr. W. W. Wood, Jamestown, treasurer.

Dr. Jay Arthur Myers, Minneapolis, Minnesota, chairman of the Board of Editors of the *JOURNAL-LANCET*, was elected as the First Vice President of the American College of Chest Physicians at the annual meeting of the College held at Cleveland, May 31 to June 2. Dr. Myers served as Chairman of the Membership Committee this past year and a successful membership campaign was concluded under his leadership.

Dr. William C. Bernstein who recently completed his graduate training in proctology at the University of Minnesota hospitals, has opened offices for the practice of proctology in the Lowry Medical Arts Bldg., St. Paul, Minnesota. Dr. Bernstein formerly practiced in New Richland, Minnesota.

Dr. Harry W. Christianson of Minneapolis, was elected a Fellow of the American Protologic Society at the annual meeting in Cleveland.

Dr. J. Edmond, Farmington, Minnesota, a United States Army medical reserve officer, has been called into service and is temporarily located at Fort Ord, Salinas, California, a member of the First Medical regiment. Later he will be transferred to the station hospital at Camp Roberts, California.

Dr. Hans E. Guloiën, formerly of Minnewaukan, North Dakota, has become associated with the Dickinson clinic at Dickinson, North Dakota.

Three distinguished service medals of the Minnesota Medical association were awarded at the association's annual dinner to: Dr. C. M. Jackson, Minneapolis; Dr. C. B. Wright, Minneapolis, on whom the award was conferred posthumously; and Dr. L. L. Sogge, Windom.

Dr. August C. Orr, former director of the division of child hygiene for the North Dakota state health department, is now associated with Dr. R. W. Henderson in the practice of medicine in Bismarck. For the past two years Dr. Orr had been at Newberry, Michigan, where he served as director of a district health department.

Dr. A. F. Dysterheft, Arlington, Minnesota, a reserve officer, has been called for service in the Medical Corps of the Army and will be stationed at Fort Riley, Kansas. He holds the rank of captain.

Dr. G. Christianson, practicing physician of Sharon, North Dakota, for the past two years, has gone to Cambridge, Massachusetts, where he will take a postgraduate course in surgery at Harvard university. His practice will be taken over by Dr. A. O. Arneson of McVille, North Dakota, who also will continue practicing at McVille.

Dr. P. J. Pankratz, Mt. Lake, Minnesota, has been assigned to Fort Leonard Wood at Rolla, Missouri, for service in the Medical Corps of the Army.

Dr. Kenneth L. Nelson has opened offices in New Prague, Minnesota. He will take over the practice of Dr. F. H. Weichman.

Dr. William E. Linton, who has been assisting Dr. R. S. Westaby and Dr. G. E. Whitson, Madison, South Dakota, has moved to Los Angeles, California, his former home. He expects to begin work in the United States Army Medical Corps shortly.

A free pre-school clinic was held in Deadwood, South Dakota, last month through the coöperation of the Red Cross, the state board of health, local physicians and dentists, the county public health nurse and the nursing advisory committee.

Drs. R. H. Puumala of Cloquet and F. T. Becker of the Duluth Clinic were awarded medals by the Southern Minnesota Medical association at the recent convention of the Minnesota State Medical association. The award is given annually for a scientific medical exhibit or a study of unusual disease.

Dr. W. W. Taylor, Whitefish, Montana, was elected president of the Great Northern Surgeons' association recently.

North Dakota in 1940 was the healthiest place to live in, according to provisional mortality rates released by the United States Public Health Service recently. The death rates for North Dakota was 7.9 per 1000 population compared with a rate of 10.5 for the United States.

Dr. H. Z. Giffin of Rochester was elected president of the Minnesota State Medical association and will succeed Dr. B. J. Branton of Willmar January 1. Dr. N. H. Baker, Fergus Falls, was elected first vice-president.

Dr. Claude M. Mears, formerly associated with Dr. Soltero at Lewistown, Montana, is now practicing with the Cooney-Gallivan-Thompson clinic in Helena.

The University of Minnesota Medical School has accepted 125 new students—10 per cent more than usual—for admittance next fall. Dr. Harold S. Diehl, dean of the medical school, who attended the Chicago meeting of the executive council, Association of American Medical Colleges, said the council has recommended that other medical schools follow Minnesota's example to help cut down a shortage of doctors caused when many were called into the army.

Dr. Arthur Koepsell and Dr. Charles W. Froats of St. Paul are now Diplomates of the American Board of Obstetrics and Gynecology through qualifying in the June examinations in Cleveland.

Dr. R. R. Hendrickson, medical director at Buena Vista Sanatorium, Wabasha, and formerly staff member at the Fair Oaks Sanatorium, Wadena, has been named superintendent of the San Beach sanatorium near Lake Park, Becker county, Minnesota. He succeeds Dr. L. H. Fancher whose resignation takes effect August 1.

Three hundred and ninety-four pre-school children were examined by the Missoula, Montana, city health staff in the annual pre-school health roundup which was sponsored by the Parent-Teacher association recently.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth. Dr. William A. O'Brien, Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota, is the speaker. Dates and subjects are as follows: July 5—Food Allergy; July 12—Colitis; July 19—Migraine; July 26—Missing Teeth.

In a brief ceremony of welcome as a new member of the Medical and Surgical Relief Committee of America, Dr. Frank H. Lahey, President-elect of the American Medical Association, was presented with the first of the Committee's new emblems at a meeting held June 1st at the Union Club, Cleveland. The presentation was made by Mrs. Millicent Rogers Balcom, executive chairman. Replicas of the emblem, a lapel ornament in the form of a modified caduceus combined with a sword of mercy, were also presented to Dr. Nathan B. Van Etten, outgoing president of the American Medical Association who is a member of the Committee's New York group of physicians and to other Committee members from various states throughout the country who are now in Cleveland as delegates to the A. M. A.

The Illinois State Department of Public Health and the Children's Bureau, U. S. Department of Labor is sponsoring ten four-weeks courses in obstetrics at the Chicago Lying-in Hospital during the fiscal year 1941-1942. Only a limited number of physicians will be accepted for each course. The only cost to the individual is for room and board and \$25.00 (\$10.00 of which is refunded at the completion of the course). Applications and inquiries should be addressed to: Postgraduate Course, Department of Obstetrics and Gynecology, 5848 Drexel Avenue, Chicago, Illinois.

The completed program for the second New England Conference on Tomorrow's Children, to be held at Littauer Center, Cambridge, Massachusetts, on July 16, 17 and 18 under the auspices of the Harvard Summer School and 27 coöperating organizations, has been released by the Conference planning committee, of which Prof. Carle C. Zimmerman, Department of Sociology, Harvard University, is chairman. The program lists as speakers more than 30 leaders in various fields of work and thought touching on the family, child welfare and population problems, including Mrs. Franklin D. Roosevelt. Information may be obtained by writing to Eugene L. Belisle, care of Harvard Summer School, Wadsworth House, Cambridge, Massachusetts.

NOTICE TO MINNESOTA PHYSICIANS re: Laboratory Work Minnesota Department of Health Division of Preventable Diseases

Owing to reduction in State funds appropriated by the last Legislature for the coming biennium, it will be necessary beginning July 1, 1941, to reduce certain laboratory services offered by the Division of Preventable Diseases to physicians of the State. Careful consideration has been given by members of the State Board of Health as well as members of our staff as to elimination of laboratory work without injuring important services.

Changes in laboratory services beginning July 1, 1941, will be as follows:

Agglutination Tests will be done on request consistent with diagnosis. Physicians are requested to fill in the diagnosis on agglutination data cards and request specific tests following this. The terms "all tests", "complete agglutination", and "complete serology", will not be interpreted as a specific request. In the absence of a definite or a tentative diagnosis, tests will not be done and blood will be held *three* days only for orders, as results of tests on blood held longer are not reliable.

Important: In submitting specimens for agglutination tests physicians are urged to fill out an agglutination data card. If a Wassermann test is also desired, a Wassermann data card should also be filled out and returned with the specimen in each instance. If examination is for food handlers, only typhoid and paratyphoid agglutination tests will be done. Weil-Felix tests will be done on request during tick season.

Pneumococcus Typing: Typing will be done only for the following and therapeutic serum furnished for same: Types 1, 2, 3, 4, 5, 7, 8, 14, and 19. Otherwise pneumonia service, including night service, will continue as before.

Undulant Fever: Blood cultures will be continued but animal work will be discontinued and culture work may be limited.

Miscellaneous Work: Miscellaneous tests having a lesser public health significance are to be discontinued. It is proposed to limit miscellaneous tests essentially to the following:

- Blood smears to be examined for malarial parasites.
- Blood smears to be examined for lead poisoning.
- Blood smears to be examined for evidence of parasitic infection.
- Blood cultures for typhoid and paratyphoid infection.
- Stool specimens for parasites.
- Various foods involved in outbreaks of food poisoning.

All other laboratory work will continue as before.

A. J. CHESLEY, M.D.,
Executive Officer.

June 19, 1941.

Letter from Britain

The following letter was received by one of our readers from Dr. Wallace H. Cole, resident medical director, American Hospital in Britain, Ltd., Park Prewett Hospital, Basingstoke, Hants.

It is a great privilege to be allowed to take local charge of this unit and of course I cannot expect to accomplish what Phil Wilson could have done if he had stayed on, but I am trying in my humble way to keep things going and not disgrace the American orthopedic profession too much. Phil has started a hospital of which he can justly be proud and when I hear of the various barriers which blocked his way and the manner in which he met and overcame them, I know that no one else could have gone so far and yet left such a feeling of goodwill behind him. Any effort that I can make must be very feeble in comparison.

As many of you know, I came over on the Clipper to Lisbon and by plane from there to England, so that the prelude to my work over here was most enjoyable and probably as pleasant an interlude as one could imagine, being doubly enjoyable on account of the presence of Wendell Wilkie and his party on the Clipper. The Clipper left New York on a Wednesday morning and the next Monday evening I arrived at the house where the personnel of the unit is living, having my first experience with the blackout as the last of the new travelling adventures. I got off the train in the dark, being helped like a blind man by a kind soldier and then rode about twelve miles in an automobile with only enough light from one headlight, the other having had the bulb removed, to act as a warning to other cars and people on the road and with practically no illumination of the road itself. This does not seem so difficult or hazardous now as it did at the time, and it is marvelous how people have accommodated themselves to night driving without lights and how well they do it.

The great difference that struck me immediately in the present hospital as compared to the hospitals during World War I was, of course, the number of civilian patients in the wards. The casualties as I saw them in 1917 at Liverpool were one hundred per cent military and we who were working there were officers in the Medical Corps of the Army, while here at Park Prewett the conditions are not greatly dissimilar to those in a large civilian hospital. This is a hospital with over 1500 beds, with several wards devoted to women patients and with a gynecological service and a children's pavilion. The civilian patients include bombing casualties, and yet many who are not, and there are some so-called "compassionate" admissions. Our unit is the orthopedic center for this area and is running independently some 300 beds of the 1500 total, all of which are for male patients, with well over 50 per cent being military or naval casualties, but on account of transfers and consultations we also always have some female patients scattered through the other wards. To show the varying character of our work, I might mention here that one of these is a woman with an arthritis of her right hip of several years duration who had gradually become incapacitated on account of pain and deformity and upon whom I performed a vitallium cup arthroplasty.

We have patients varying from a one-year-old baby with a congenital hypertrophy of the second and third toes of one foot to an old man of 87 years who is senile and has a fractured femur due to a bombing injury. I have been greatly interested in the use of the apparatus of Roger Anderson and of Haynes in the treatment of fractures of the long bones by members of this unit, and I think that a real test of these methods in war surgery is being made. The outstanding features which appeal to one are the comfort of the patients and the comparative ease with which they can move around and often use crutches even with a femur and tibia and fibula on the same side involved. Anatomically the fragments can be beautifully adjusted in fresh fractures, but, of course, the position cannot be so accurately obtained in the older cases which have been evacuated to us

with malposition. In badly comminuted fractures, especially those which are compounded with loss of fragments, the external fixation of the pins or screws placed above and below the fragments seems to be undoubtedly the method of choice. One great advantage in the methods is that patients can be evacuated quickly if needed, which, if course, is not possible, for example, with fractures being treated in balanced traction in a Bolham frame, and it would seem that in hospitals near the Channel this might be a definite advantage. The main objections which might be raised to these methods of so-called external fixation of fragments are that union does not always seem to take place as rapidly as with some other ways of fixation, that distortion of fragments is very easily obtained and overlooked, and that the pins through the lower end of the femur definitely limit knee joint motion by transfixion of the fascia lata and ilio-tibial band as with ordinary skeletal traction at this point. Undoubtedly the definite indications will be evolved gradually.

The modification of these methods to apply to small bones of the hand and foot, as devised by Dr. Frederick Waknitz of this unit, will probably be of great value. This small apparatus, made to use two small staggered pins in each fragment as with the Roger Anderson method, has also been used in fractured mandibles with beautiful fixation and approximation of the fragments and very early motion of the jaw. I believe its greatest field may be with these latter cases and Sir Harold Gillies, who is in charge of the plastic work here at Park Prewett, is definitely enthusiastic about it and already his workers have devised modifications of the original clamp. The idea, however, is definitely due to Waknitz, and the first case, which is responsible for the activity of the plastic unit, was operated upon by Converse and himself, both of this unit.

Chemotherapy of wounds is one other feature of the work here that I would like to mention without going into any details. There seems to be no doubt that superficial wounds can be sterilized by the local application of sulfathiazol or sulfanilamide after they have become infected, and allow earlier skin grafting and healing. An article by Col. Colebrook in the March 1 issue of the *Lancet* shows in general what is being done here, and I recommend the article to you. Deeper wounds with infection also seem to respond to chemotherapy and plaster of paris fixation in a very encouraging way. All of our wounds are being studied bacteriologically at the time of dressings, and an effort is being made to correlate the type of infection with the healing period, although we have not had enough material as yet to warrant any definite conclusions.

As there has been no severe "blitz" in our areas for some time, our service is not very active at present, but we are seeing training injuries, such as tears or suspected tears of knee joint cartilages, some fractures, and ligamentous lesions, etc., in addition to a certain number of chronic conditions like hallus valgus or rigidus low backs, postural strain, and ununited fractures. We are ready to jump in actively in acute work at any time we may be needed, and a convoy of thirty-five patients is being received this afternoon, which will keep us from loafing for a time.

There must be some of you who would like to take six months or a year off and come over here to work in this unit, for it will be an experience that will be a great satisfaction to anyone who undertakes it, not only because you are assisting in a just cause but also on account of the work itself. Let Phil Wilson know if you feel the way I do about it.

Before closing, let me ask for any suggestions that you may have relative to the work over here, as we are very anxious to keep our standards as high as possible, and constructive advice as to new methods, theoretical or practical, new devices, and even gadgets will be very welcome.

My best wishes.

Very sincerely,

WALLACE H. COLE, M.D.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
ON MAY 9, 1941
APRIL EXAMINATION

Name	School	Address
Ahern, Gerald Steber	U. of Minn., M.B. 1939, M.D. 1940	Mpls. General Hospital, Minneapolis, Minn.
Babb, Frank Shaleen	U. of Western Ont., M.D. 1938	Mayo Clinic, Rochester, Minn.
Brownson, Bradley Claude	Tulane U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Cleaves, William Donald	U. of Minn., M.B. 1940	St. Luke's Hospital, Duluth, Minn.
Crosbie, Stanley	U. of Minn., M.B. 1941	4053 Garfield Ave. S., Minneapolis, Minn.
Crowley, Daniel Francis, Jr.	U. of Iowa, M.D. 1938	Mayo Clinic, Rochester, Minn.
Daugherty, Guy Wilson	Med. Col. of Va., M.D. 1937	Mayo Clinic, Rochester, Minn.
Fingerman, David Louis	U. of Minn., M.B. 1939	Mpls. General Hospital, Minneapolis, Minn.
Foxworthy, Laurel Rae	Ind. Univ., M. D. 1939	Mayo Clinic, Rochester, Minn.
Gelbach, Philip Delmont	U. of Pa., M.D. 1939	Mayo Clinic, Rochester, Minn.
Grabow, John Jergun	Creighton U., M.D. 1938	1820 Jefferson St., Duluth, Minn.
Graves, James Huntington	U. of Minn., M.B. 1940	Ancker Hospital, St. Paul, Minn.
Haavik, John Edward Thue	U. of Minn., M.B. 1940	Ancker Hospital, St. Paul, Minn.
Hall, Wendell Howard	U. of Minn., M.B. 1940	224 W. 52nd St., Minneapolis, Minn.
Hallberg, Olav Erik	U. of Minn., M.D. 1940	Mayo Clinic, Rochester, Minn.
Hardman, Sue Colquitt	Johns Hopkins, M.D. 1938	Mayo Clinic, Rochester, Minn.
Haserick, John Roger	U. of Minn., M.B. 1940	Ancker Hospital, St. Paul, Minn.
Heinz, Lawrence Henry	U. of Minn., M.B. 1940	St. Joseph's Hospital, St. Paul, Minn.
Hildreth, Allen Wesley	Cornell U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Hilger, David William	Northwestern U., M.B. 1939, M.D. 1940	University Hospital, Minneapolis, Minn.
Hill, Allan Janney, Jr.	U. of Minn., M.B. 1939, M.D. 1940	1408 S. E. 5th St., Minneapolis, Minn.
Hollenhorst, Robert Wm.	U. of Minn., M.B. 1940	Ancker Hospital, St. Paul, Minn.
Hopping, Richard Arundel	Long Island Col. of Med., M.D. 1939	Mayo Clinic, Rochester, Minn.
Jones, Reverdy Hamlin, Jr.	U. of Va., M.D., 1938	Mayo Clinic, Rochester, Minn.
Kaplan, Jack	U. of Minn., M.B. 1939, M.D. 1939	1933 Fremont Ave. S., Minneapolis, Minn.
Kloos, Edward Karl	U. of Rochester, M.D. 1938	Mayo Clinic, Rochester, Minn.
LaBree, John William	U. of Minn., M.B., 1940	Ancker Hospital, St. Paul, Minn.
Lannin, Donald Rowe	U. of Minn., M.B. 1940	St. Luke's Hospital, Duluth, Minn.
Levinson, Julian Paul	Washington U., Mo., M.D. 1937	Mayo Clinic, Rochester, Minn.
Lundgren, Olive Anga	U. of Minn., M.B. 1940	1607 Lowry Ave. N.E., Minneapolis, Minn.
MacArthur, W. J. Campbell	McGill U., M.D. 1938	Mayo Clinic, Rochester, Minn.
MacKenzie, Ralph William	U. of Minn., M.B. 1940	104 N. Miss. River Blvd., St. Paul, Minn.
Manlove, Francis Roxby	Temple U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Marsh, Otis Milton	U. of Minn., M.B. 1940	Mpls. General Hospital, Minneapolis, Minn.
Martin, Ann Lavinia	Cornell U., M.D. 1938	University Hospital, Minneapolis, Minn.
Marvin, Charles Peterson	U. of Minn., M.B. 1940	Ancker Hospital, St. Paul, Minn.
McEachern, Cecil Gray	U. of Western Ont., M.D. 1937	Mayo Clinic, Rochester, Minn.
McCouston, Columbus Hal, Jr.	U. of Texas, M.D. 1938	Mayo Clinic, Rochester, Minn.
McKay, Donald Richard	Northwestern, M.B. 1940	Ancker Hospital, St. Paul, Minn.
Mears, Fredrick Blackburn	U. of Rochester, M.D. 1939	University Hospital, Minneapolis, Minn.
Movius, William Robert	Northwestern, M.B. 1939, M.D. 1940	University Hospital, Minneapolis, Minn.
Musselman, Florence Jane	U. of Wis., M.D. 1938	University Hospital, Minneapolis, Minn.
Nauth, Bernard Spencer	U. of Minn., M.B. 1941	Winona, Minn.
Olson, Ivy Bernice	U. of Minn., M.B. 1940	Asbury Hospital, Minneapolis, Minn.
Olson, John Donald	U. of Pa., M.D. 1938	Mayo Clinic, Rochester, Minn.
Pennoyer, James, III	U. of Rochester, M.D. 1939	University Hospital, Minneapolis, Minn.
Petersen, Robert Thorvald	U. of Minn., M.B. 1940, M.D. 1941	1111 Nicollet Ave., Minneapolis, Minn.
Phillips, Spencer Kleckner	Northwestern, M.B. 1939, M.D. 1940	Mayo Clinic, Rochester, Minn.
Polley, Howard Freeman	Ohio State U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Poore, John Chapman	U. of Minn., M.B. 1940	Trinity Hospital, Minot, N. D.
Radcliffe, James, Jr.	Yale U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Ramsay, Beatty Haig	U. of Manitoba, M.D. 1940	University Hospitals, Minneapolis, Minn.
Rizer, Dean Kirby	Harvard U., M.D. 1938	1931 Med. Arts Bldg., Minneapolis, Minn.
Ryan, James Doyle	St. Louis U., M.D. 1940	Fairfax, Minn.
Schilla, Fredrick Wm., Jr.	U. of Minn., M.B. 1940	Milwaukee Co. Hospital, Wauwatosa, Wis.
Schmitz, Robert Lenzen	U. of Chicago, M.D. 1938	Mayo Clinic, Rochester, Minn.
Selin, Golden	U. of Minn., M.B. 1941, M.D. 1941	Glen Lake Sanatorium, Oak Terrace, Minn.
Smith, Frederick Harvey	U. of Western Ont., M.D. 1938	Mayo Clinic, Rochester, Minn.
Starekow, Milton David	Rush Med. Col., M.D. 1940	St. Joseph's Hospital, St. Paul, Minn.
Stone, Stanley Paul	U. of Minn., M.B. 1941	Ancker Hospital, St. Paul, Minn.
Swanson, Vincent Francis	Northwestern, M.B. 1938, M.D. 1939	611 Delaware S.E., Minneapolis, Minn.
Tinney, William Scott, Jr.	U. of Pa., M.D. 1938	Mayo Clinic, Rochester, Minn.
Van Bergen, Frederick Hall	U. of Minn., M.B. 1941	Route 1, Hopkins, Minn.
Vines, Robert William	U. of Neb., M.D. 1937	Mayo Clinic, Rochester, Minn.
White, Raleigh R., III	Tulane U., M.D. 1939	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Nelson, Roy Arthur	U. of Chicago, M.D. 1939	Fergus Falls, Minn.
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NATIONAL BOARD CREDENTIALS

Cannon, Edward E.	Rush Med. Col., M.D. 1939	Mayo Clinic, Rochester, Minn.
Wells, Gideon Robbins	Harvard U., M.D. 1938	Mayo Clinic, Rochester, Minn.

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MEDICAL AND SURGICAL RELIEF COMMITTEE OF AMERICA EMBLEM

The new emblem of the Medical and Surgical Relief Committee of America is enjoying a brisk sale and is available all over the country through Committee members or their appointed representatives.

The emblem is a gold plated, enameled lapel ornament in the form of a modified Caduceus combined with a sword of mercy. It is made up in the form of a pin for women and a lapel ornament for men. The cost is \$1 each.

The sale of the emblem is a feature of the campaign undertaken by the Medical and Surgical Relief Committee, a nationwide organization consisting of some 300 physicians and surgeons throughout the country who collect surplus medical supplies and when necessary, funds, for the relief of civilians and armed forces in Great Britain and Allied countries. The Committee's headquarters are located in New York. Dr. Claude C. Kennedy is the Committee member for Minnesota.

SOLAREUM SANITARY PAPER SHEETING

Solareum Sanitary Paper Sheeting is enjoying an increased demand by physicians everywhere according to the supply firms who furnish it. Its use has been made more flexible than ever by certain innovations in the roll holders that hold the paper sheeting and which match perfectly the wood and metal finishes of the treatment and operating tables to which they are attached.

For army tables there is an eighteen inch roll holder attached to the head of the table. A similarly located roll holder of twenty inch width is made for wood tables. There is a floor style holder twenty-four inches wide in hexagon shape in which the wood finishes are likewise imitated. The roll holders attachable to the heads of the table actually appear to be a part of the table because of the nicety in matching. Solareum is said to be serving about 100,000 patients every month.

WAUKESHA SPRINGS SANITARIUM CELEBRATED

Waukesha, Wisconsin, "The Spring City," is known throughout this country and Europe as a health resort. For something over forty years, Waukesha Springs Sanitarium has contributed to the fame of the locality.

Designed and equipped for the special care of those suffering from various forms of nervous disorder and mental ill health, it is located in a park of twelve acres with every natural advantage of light, air and sunshine together with being just far enough inland from Lake Michigan to have the climate favorably modified thereby. Medical treatment is ethical and directed by physicians resident in the Sanitarium who give their entire time to the work of the institution. One of Wau-

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kesha's springs of pure water is on the grounds. It furnishes the drinking water used.

The institution consists of two large buildings. The main structure is of modified Colonial style and there is a hospital department situated in a large hickory grove adjacent. Surroundings are pleasant and homelike and contribute to the maximum of comfort and possible restoration.

SULFAGUANIDINE MADE AVAILABLE BY LEDERLE LABORATORIES

Following extensive clinical tests sulfaguanidine now joins sulfanilamide, sulfapyridine and sulfathiazole to combat infectious diseases. It differs from the other sulfa-drugs in its action. Whereas other members of the family are readily absorbed into the blood stream, sulfaguanidine when administered by mouth remains largely in the intestinal tract. Thus the new drug is able to destroy or prevent the growth of certain bacteria in the alimentary canal. This property of sulfaguanidine makes it particularly valuable in combatting acute bacillary dysentery, a disease prevalent in armies under unsanitary conditions, and as a prophylactic agent in surgical operations on the colon. By inhibiting the growth of certain bacteria common to the human intestines, sulfaguanidine reduces the possibility of a spread of infection following abdominal operations.

Sulfaguanidine should be administered only under the direct and constant supervision of a physician.

Sulfaguanidine remains in the colon in high concentration and inhibits there the growth of bacteria of the class known as gram-negative bacilli. In this class of bacteria are those which cause acute bacillary dysentery and clinical tests on this disease have shown consistently good, and sometimes sensational, results. Favorable clinical response to sulfaguanidine in this disease is shown by a fall in temperature, decline in white cell count, reduction of the diarrhea characteristics of the disease.

Surgical use of sulfaguanidine also takes advantage of its relatively poor absorption. By administering the drug before an operation on the colon, the chances of accidental infection of the abdominal cavity are appreciably lessened.



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Minneapolis, Minnesota
August, 1941

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Transactions of the North Dakota State Medical Association

Fifty-Fourth Annual Session

Grand Forks, North Dakota

May 19, 20, 21, 1941

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PROCEEDINGS
of the
HOUSE OF DELEGATES
FIFTY-FOURTH ANNUAL MEETING
of the
NORTH DAKOTA STATE MEDICAL
ASSOCIATION
Grand Forks, North Dakota
Monday, May 19, 1941

FIRST SESSION

The first session of the House of Delegates was called to order by the Speaker of the House of Delegates, Dr. John H. Moore, at 9:00 A. M. Monday, May 19, 1941, in the Epworth Hall of the Methodist Church, Grand Forks, N. D.

Following a report by the Committee on Credentials, the following Delegates were declared seated:

Doctors:

- Wm. Stafne, Fargo
- Paul Burton, Fargo
- John Fawcett, Devils Lake
- P. H. Woutat, Grand Forks
- Fred Fergusson, alternate, Kulm
- W. W. Wood, alternate, Jamestown
- A. E. Westervelt, alternate, Bowdon
- C. J. Meredith, Valley City
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- O. T. Benson, Glen Ullin
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- A. P. Nachtwey, Dickinson
- W. W. Wright, Williston
- Syver Vinje, Hillsboro
- W. A. Liebeler, Grand Forks
- A. R. Sorenson, Minot

The Speaker declared a quorum present.

The Minutes of the 1940 Session of the Association, held in Minot, and published in the September, 1940, issue of the JOURNAL-LANCET were accepted as printed.

Secretary's Report

L. W. LARSON, M.D.

The total membership for 1941 on May 5th was 351. Of this number, 339 are paid-up members and 12 are Honorary Members. The membership on May 5, 1940, was 357. The total membership for 1940 was 398; of this number 387 were paid memberships and 11 were Honorary Memberships (see Table No. 1).

TABLE No. 1

Comparison of Membership in 1939 and 1940

	1939	1940
Paid Memberships	394	387
Honorary Memberships	3	11
Total	397	398

In order to determine whether or not the increase in annual dues which began in 1940 had any material effect upon the membership in 1940, a survey of the records has been made (see Table No. 2). You will note that 33 who paid their dues in 1939 did not do so in 1940. However, only 11 were delinquent, 13 having moved out of the state and 9 having died. Upon inquiry, 3 of the 11 delinquents gave as their reason, the increase in dues; 7 gave no reasons; one has rejoined this year, and one retired and is eligible for Honorary Membership.

TABLE No. 2

Analysis of Loss in 1940 Membership from
1939 Membership

Members moving out of state; did not pay 1940 dues	13
Deaths during 1939	9
Delinquents (continued practice in state)	11
Total	33

The loss in the 1940 membership among 1939 members was almost completely offset by the admission of 22 new members during 1940 and the readmission of 8 who had been members of the Association prior to 1939 (see Table No. 3).

TABLE No. 3

Analysis of Gains in Membership During 1940

New Members	22
Readmission of members in good standing prior to 1939	8
Total	30

It is too early to predict what the total membership in 1941 will be. To date, it is very close to that of 1940 (see Table No. 4). However, there have been seven deaths among our 1940 members, and 15 of the 23 1940 members who have entered the military service have not paid their 1941 dues. Whether these losses can be retrieved by new and delinquent memberships remains to be seen.

TABLE No. 4

Analysis of 1941 Membership on May 5th, Compared
with 1940

Total Membership, May 5, 1940	357
Total Membership, May 5, 1941	351
Total Deaths among 1940 members	7
Total 1940 Members (23) who have entered military service and have not paid 1941 dues	15

Your President, Dr. Glaspel, has been concerned during his year in office, with the fact that only about 80 per cent of the physicians practicing in the state are members of the Association. Through his leadership, the District Societies, the Councilors and the Secretary have been exhorted to bring in new members and to encourage delinquents to pay their dues. That this campaign has produced results is shown in table No. 5.

TABLE No. 5

Preliminary Report of Gains in Membership for 1941
as of May 5th

New Members	15
Readmission of members who were in good standing prior to 1940	6
Total	21

Field Work. I have visited seven district societies during the past year. I found a keen interest in the affairs of the Association in each Society visited. I am indeed sorry that I could not visit every Society in the state but I could not spare the time.

Extraordinary Activities of the Secretary's Office. As chairman of the Committee on Medical Preparedness, a great deal of extra correspondence and clerical work has had to be taken care of in the Secretary's Office. This assignment has also

necessitated travel to the Chicago headquarters of the American Medical Association, and to several committee meetings in the state, outside of Bismarck. As a result, many of the things which I had planned to do as Secretary had to be abandoned for lack of time. However, this is a job which must be done in order that we may cooperate fully with the American Medical Association and the Federal Government in their joint attempt to provide physicians for the armed forces and the civilian population.

Referendum Vote on the Increase in Dues. The final vote was: 125 against and 114 in favor. The tabulated vote by districts is as follows:

	For Increase	Against Increase
Cass County	5	47
Devils Lake District	?	?
Grand Forks	10	35
Kotana	9	0
Northwest	20	10
Richland County	5	2
Sheyenne Valley	11	3
Sixth District	21	4
Southern	6	1
Southwestern	21	0
Stutsman County	1	10
Traill-Steele	0	7
Tri-County	5	*6
Totals	114	125

Recommendations for Your Consideration:

1. That the State Association dues, for those members who volunteer or are called into the Military Service of the United States, be either cancelled for the period of such service or be paid out of some associated fund.
2. That the state be divided into ten Councillor Districts (see Constitution, Article VII, page 8, and By-Laws, Chapter IV, Section 10, page 14.) I would suggest that the following Councillor Districts be established:
 - First Councillor District—Cass County Society, Richland County Society.
 - Second Councillor District—Devils Lake District.
 - Third Councillor District—Grand Forks District, Traill-Steele Society.
 - Fourth Councillor District—Northwest District, Kotana Society.
 - Fifth Councillor District—Sheyenne Valley District.
 - Sixth Councillor District—Sixth District Society.
 - Seventh Councillor District—Stutsman County Society.
 - Eighth Councillor District—Southern District.
 - Ninth Councillor District—Tri-County Society.
 - Tenth Councillor District—Southwestern District.
3. That the House of Delegates authorize the Secretary to issue Charters to the following District Medical Societies (see By-Laws, Chapter XII, Section 2, page 21).
 - Cass County Medical Society.
 - Devils Lake District Medical Society.
 - Grand Forks District Medical Society.
 - Kotana Medical Society.
 - Northwest District Medical Society.
 - Richland County Medical Society.
 - Sheyenne Valley Medical Society.
 - Sixth District Medical Society.
 - Southern District Medical Society.
 - Southwestern District Medical Society.
 - Stutsman County Medical Society.
 - Traill-Steele Medical Society.
 - Tri-County Medical Society.
4. That the following be approved as Honorary Members, (see Constitution, Article IV, Section 4, page 7.)
 1. Dr. A. T. Horsman, Devils Lake, N. D. Licensed in North Dakota, 1890. Member of Devils Lake District for many years.
 2. Dr. W. F. Welch, Larimore, N. D. Licensed in North Dakota 1887. Member of Grand Forks District for many years.

5. That the President be authorized to appoint a Special Committee, consisting of five members, to study the question of "Medical Service Plans," and report its findings at the 1942 Annual Session and that the Council be asked to appropriate a modest amount of money for the use of this Committee. A great deal is being done in several states in an effort to solve the problem of adequate medical care for the low income groups. The problem differs in each state; in North Dakota it differs in various sections of the state. The medical profession must assume the leadership in the solution of this important problem.

I wish to thank the State Association Officers, the Councilors, the Officers of the District Medical Societies, and the Chairmen of the various Committees, for their willingness to cooperate in my endeavor to expand the records and facilities of the Secretary's Office.

Respectfully submitted,
(Signed) L. W. LARSON, M.D., Secretary.

Supplementary Report of Secretary

The above report as published in the Handbook gives the total membership on May 5, 1940. The membership on May 17th was as follows: 346 Paid-Up Members; 11 Honorary Members. One of the Honorary Members died since the report in the Handbook was prepared.

The Secretary's reports were referred to the Reference Committee, appointed to consider the Report of the Secretary.

Treasurer's Report

Dr. W. W. Wood, Treasurer, gave a detailed report of the income and expenditures of the Association during the past year and a statement of the financial condition of the Association at the present time.

Report of the Chairman of the Council of the House of Delegates—1940-1941

The Council of the North Dakota State Medical Association held two sessions at last year's meeting in Minot. A special meeting was held in Fargo on December 29, 1940.

At the meeting a year ago the books of the treasurer, Dr. W. W. Wood, were audited by a committee of the council and found to be correct. There was a balance of \$2,321.57 on hand.

The following members of our association were appointed as a Board of Editors of the JOURNAL-LANCET for one year:

- Dr. J. O. Arnsen
- Dr. H. D. Benwell
- Dr. W. H. Long
- Dr. G. W. Toomey
- Dr. F. O. Woodward
- Dr. L. W. Larson.

The following were appointed as a Committee to have charge of the printing of the new constitution:

- Dr. G. M. Williamson
- Dr. L. W. Larson
- Dr. N. O. Ramstad.

The Northwest District Medical Society was allowed \$200.00 to defray the expenses of the annual meeting at Minot.

Appropriations were made for the use of committees and officers of the state association not to exceed the following amounts:

Radio committee	\$ 100.00
Anti-Tuberculosis committee	100.00
Medical Economics committee	100.00
Emergency fund as required by the Council	200.00
Services, stenographer, 1941 meeting	150.00
Delegates to A. M. A. Meeting	150.00
President of the State Association, for travel and other expense	50.00
Chairman of Council as required for emergency expenses of the Society	125.00
Secretary of State Association for postage, stationery and miscellaneous expense	120.00
Secretary of State Association for visiting local societies	100.00
JOURNAL-LANCET	800.00

\$1,995.00

It was decided to allow the secretary of the State Association \$1,000.00 for his services until the next annual meeting, said amount to include stenographic services.

For extra services during the year Dr. Skelsey was allowed \$100.00.

A special meeting of the council was held in Fargo, December 29, 1940. The chief purpose of the meeting was to arrange for the representation of the medical association at the session of the State Legislature and to consider proposed legislation of interest to the medical profession. Present at this meeting were President C. J. Glaspel, Secretary L. W. Larson, W. C. Fawcett, Chairman of the Legislative Committee, and eight councillors.

A brief summary of our activities follows:

Dr. George M. Williamson reported on matters concerning the medical profession throughout the state since the meeting in May, 1940. He also summarized the activities of the State Board of Medical Examiners and the problems which had come before them.

Dr. L. W. Larson gave a report of his numerous activities as secretary of the association. The Medical Preparedness Program has caused a tremendous increase in the work of the secretary.

Dr. Larson reported that on December 26, 1940, there were 394 members in good standing, of whom 379 had paid dues in full for the year. Four had paid for part of the year and 11 were Honorary Members. Twenty-four new members were taken into the association during the year.

Dr. George M. Williamson reported that 460 physicians had paid the annual registration fee for 1940. Twenty-two paid for half a year which makes a total registration of 484. Seventy-nine paid the non-resident fee of \$2.00 each.

President C. J. Glaspel addressed the council regarding various matters concerning the medical profession in the state. He regretted that there were so many members of the profession who were not interested in membership in the state medical association. He suggested that special efforts be made to bring into the local and state medical associations non-members of the profession who had the proper qualifications for membership. It was decided to have the secretary of the state association send a list of the non-members to the councillors in each district and that they should act with the secretary of the local society in obtaining new members.

Dr. W. W. Wood sent a detailed report of receipts and expenditures as treasurer of the North Dakota State Medical Association. On December 26, 1940, there was a balance of \$1,208.00 on hand.

Dr. W. C. Fawcett, Chairman of the Legislative Committee, reported that his committee had met and he made suggestions for the 1941 session of the state legislature. The council appointed Dr. W. C. Fawcett to act as a representative of the medical profession of the state at the coming session of the legislature.

The council appointed a special committee consisting of Drs. A. D. McCannel, P. G. Arzt, President C. J. Glaspel, Secretary L. W. Larson and N. O. Ramstad to act in an advisory capacity to the Committee on Medical Legislation. This committee was authorized to act for the council so far as the appropriation of funds for the Committee on Legislation was concerned.

In accordance with the provisions of the newly adopted constitution, bonds have been secured for the treasurer of the state association in the amount of \$5,000.00 and for the secretary of the association \$1,000.00, the cost to be paid by the state association.

The vote on the referendum to increase the dues of the State Medical Association from \$10.00 to \$20.00 was presented by Dr. L. W. Larson. The vote was canvassed by the council and the following result announced: For the increase in dues—114 votes; against—125 votes. The council declared that the proposition was lost and that the dues would remain at \$10.00 per annum.

It was decided that each local medical society was entitled to a charter from the North Dakota State Medical Association, such charter to be issued when arrangements could be made.

A resolution was passed asking the president and the sec-

retary of the North Dakota State Medical Association to send a resolution of condolence to the family of the late Dr. C. E. Stackhouse.

The Board of Medical Examiners was asked to publish the Christmas greetings of Dr. James Grassick if he gives his permission.

Dr. Frank Darrow of Fargo was elected as alternate delegate to the American Medical Association to fill the vacancy created by the decease of Dr. C. E. Stackhouse.

An inventory of the property of the State Association was made which consisted of cash with Dr. W. W. Wood, Treasurer, \$1,208.00 and office equipment for the secretary \$118.27.

During the past year the meetings of the council have been well attended, harmony has prevailed and careful attention has been given to the duties assigned to it. We especially wish to thank President C. J. Glaspel and Secretary L. W. Larson for their assistance and cooperation.

Respectfully submitted by

Signed: N. O. RAMSTAD, M.D.,

Chairman of the Council.

The report of the Chairman of the Council was referred to the proper Reference Committee for consideration.

REPORTS OF COUNCILLORS

First District

The Cass County Medical Society has 55 paid-up members for 1941, showing a loss of eight since 1940. Five of these have gone into the Army for active service and three are no longer living in our jurisdiction. All eligible men in Cass County are active or probationary members of the Society.

Eight regular monthly dinner meetings have been held with an average attendance of 35. The scientific programs have all been put on by our own members except one at which Dr. A. E. Brown of Rochester, Minnesota, gave an address on the sulfa group of drugs. The year has been very harmonious and the usual friendly relations of the members of the Society have continued.

Action against paid newspaper pictures under the caption "Notables of Fargo" was taken.

Signed: MURDOCK MACGREGOR, M.D.

Councillor.

Second District

Following is Devils Lake District Medical Society report for the year 1940-1941.

The Devils Lake District Medical Society has held four meetings, all at Devils Lake. Have taken in four new members. At present we have twenty-eight members, all in good standing.

Our first meeting in July, 1940, was given over to discussion of the fees of the Welfare Board and the appointing of a Committee on Economics. There too, was a Committee approved on Medical Preparedness. At the October meeting, we had a Scientific lecture with movies on Pneumonia. Dr. L. W. Larson, our State Secretary, attended this meeting and gave a very interesting talk. The meeting on January 3rd was very poorly attended, due to a storm and blocked roads. However, the Society at this meeting approved the North Dakota Hospital Association Plan. Officers were elected for 1941.

At our April meeting we approved Woman's Auxiliary plan for the State Association. Members selected for Continuation Study at the University of Minnesota. Scientific talk and plates shown by Dr. Cedric Northrop on Tuberculosis. Our meetings have been very interesting and well attended. We have no dissension in our Society. We too, are getting along fine without the Farmers Mutual Aid.

Signed: W. C. FAWCETT, M.D.,

Councillor, Second District.

Third District

Peace and harmony prevails in the Grand Forks District Medical Society, close cooperation and good fellowship in all communities.

Meetings have been held regularly; good programs presented by men from outside this Society as well as by local practitioners, which were enjoyed.

At present writing, May 16th, Secretary T. Q. Benson, who has worked diligently in rounding up the membership reports—52 members with dues paid—10 who have been members have not paid for this year, and 5 others remain on the outside, and I again state this is no fault of our Secretary. I have held up sending my report earlier in order that he might have more time to work—this by his request.

We hope to have a better membership report next year. It is difficult to understand why some practitioners are negligent. They certainly would have trouble, should they want to transfer to some other state.

Some of our members have been called to active service in the Army, and we have five Honorary Members: Doctors Harris, Grassick, Burrows, G. W. Glaspel, and Welch.

Signed: G. M. WILLIAMSON, M.D.,
Councillor, Third District.

Fourth District

The Northwest District Medical Society has a membership of 71 in good standing. We have had nine regular dinner meetings of the society, alternating between St. Joseph's and Trinity Hospitals. The program committee for the meetings consisted of the staff of the hospital at which the meeting was held. The average attendance at the nine meetings is 31.

Following the entertainment of the State Medical Society last year, the society voted to give the surplus of \$100.00 to the National Physician's Committee to aid in their work.

During the year we have had splendid scientific programs. In addition to the regular scientific discussions, we had the following special features:

Dr. L. W. Larson, State Secretary, visited us on November 28 and discussed the question of a full-time secretary. He discussed all of the favorable and unfavorable aspects of the proposed program, and following his presentation a vote was taken which resulted in 21 for, and 4 against the proposal.

A film on cardiographs produced by Mead-Johnson Company was presented at one of our meetings.

Dr. Nelson Barker of the Mayo Clinic discussed thrombophlebitis, and Dr. Cecil Watson, Professor of Medicine at the University of Minnesota, gave a very interesting and instructive talk on Jaundice.

The economic condition of the Northwest District has been very much improved and I am sure it is a relief to all of the men in the district to be relieved from the constant discussion of economic problems which has been so much in the forefront during the recent years. I do not believe there is a man in the district who would be in favor of again entering into a program for the care of the low income groups unless the fee schedules of the Public Welfare Board were strictly adhered to, without proration.

We have two honorary members in our District: Dr. Andrew Carr of Minot, and Dr. Timm of Makoti.

During the year three of our members, Dr. Garrison, Dr. O'Neill, and Dr. Nelson, attended the refresher courses at the Continuation Center of the University of Minnesota.

The officers this year are: Dr. D. J. Halliday, president, Kenmare; Dr. Henry Halvorson, vice-president, Minot; Dr. Woodrow Nelson, secretary-treasurer, Minot; Dr. A. R. Sorenson and Dr. Olaf Haraldson, delegates, Minot; Dr. M. W. Garrison, Dr. G. S. Seiffert, alternates, Minot.

Signed: ARCHIE D. McCANNEL, M.D.,
Councillor, Fourth District.

Fifth District

The Sheyenne Valley Medical Society has a membership of 15. Dr. E. A. Hackie transferred his membership to the Traill-Steele Society and entered practice at Portland, N. D.

Dr. G. A. Dodds has taken up practice in Valley City and Dr. R. K. Dodd, at Wimbledon.

Seven meetings have been held, several of which have been in discussion of medical economics and our relationship to welfare boards, the N. Y. A. movement, and military defense. At other meetings the Cancer Control Program was studied; a new constitution and by-laws were adopted and at another a Symposium on Pneumonia was held, with film illustration. At this meeting Dr. Larson, State Secretary, was present.

At our Annual Meeting the following doctors were placed in office: President, Dr. G. A. Dodds, Valley City; Secretary-Treasurer, Dr. C. J. Meredith, Valley City; Delegate, Dr. C. J. Meredith; Alternate, Dr. G. A. Dodds.

Respectfully submitted,
Signed: F. L. WICKS, M.D.,
Councillor, Fifth District.

Sixth District

During the past year the Sixth District Medical Society held four meetings with an average attendance of 41. Our present membership is 65.

The following members were transferred to other societies during the year: Dr. A. M. Fisher, to Jamestown, N. D.; Dr. Maude Gerdes, to Mississippi; Dr. J. A. Cowan, to Iowa.

Dr. F. E. Bunting of Mandan has retired from active practice and two members who have left the state have not paid their 1941 dues.

Nine new members were admitted during the year.

During the past year we have been greatly saddened by the death of three of our active members: Dr. C. E. Stackhouse, who has served as President of our Sixth District Medical Society and as President of our State Medical Association; Dr. A. A. Whittemore of Napoleon who served the state well as State Health Officer for many years; and Dr. L. G. Eastman of Hazen who was a recent President of our Sixth District Medical Society, and who has always taken a lively interest in our Society.

Our programs have been greatly aided by speakers from outside of our own society. These include Dr. Donald Peterson of Fargo who gave us an interesting paper; Lt. Col. B. J. Peters entertained the members of the society at Fort Lincoln and spoke to us about the medical service at Fort Lincoln; Drs. J. C. Egan and Thomas F. Edwards of Fort Lincoln gave entertaining talks about army hospital matters. One meeting was given over to the consideration of tuberculosis. The speakers were Dr. Cedric Northrop of San Haven, Dr. F. J. Hill of Bismarck and Miss Helen Katen, Secretary of the North Dakota Anti-Tuberculosis Association.

The last meeting of the year was devoted to cancer. Drs. H. M. Berg and L. W. Larson and others participated in the program.

With the aid of Dr. L. W. Larson, Secretary of the North Dakota State Medical Association, an effort has been made to bring into the society non-members who appear to be qualified. This effort has resulted in the addition of a few more members.

Your Councillor has helped the State Committee on Medical Preparedness with information and other assistance as requested.

There has been a healthy spirit of cooperation throughout our district and we are looking forward to a successful year.

Signed: N. O. RAMSTAD, M.D.,
Councillor, Sixth District.

Seventh District

Herewith is a report of the Stutsman County Medical Society for the year 1940.

We have 21 members at present. Although relatively a small group, we, nevertheless, have from three to six well attended meetings during the year.

Four meetings were held during 1940. At the February meeting Dr. H. M. Berg of Bismarck gave a very interesting paper on "Radiological Treatment of Malignancies."

At the March meeting Dr. G. A. Hunter of Fargo presented "The Treatment of Sterility."

At the October meeting Dr. Philip K. Arzt of Jamestown discussed "Convulsive Therapy in Psychiatry."

Our other meeting was devoted entirely to business affairs of the Society and Medical Profession.

Attendance has been generally good. The meeting is preceded by a good dinner, and a short social session which creates a good atmosphere and enhances the success of the same.

Officers for the year 1941: Dr. C. W. Robertson, president, Jamestown; Dr. P. K. Arzt, vice-president, Jamestown; Dr. R. D. Nierling, secretary-treasurer, Jamestown; Dr. R. D. Nierling, delegate, Jamestown; Dr. J. L. Conrad, alternate, Jamestown. Censors: Dr. F. O. Woodward, 3 years, Jamestown; Dr. T. L. DePuy, 2 years, Jamestown; Dr. Geo. Holt, 1 year, Jamestown.

(Note: Since the report was sent in, Dr. Nierling, Jamestown, was called for active service in the Army, and Dr. E. J. Larson, Jamestown, was elected secretary-treasurer, to take his place.)

The Society is in good standing, the membership harmonious, willing at all times to carry their just share of any responsibility.

Respectfully submitted,

Signed: P. G. ARZT, M.D.,
Councillor, Seventh District.

Eighth District

The Southern District Medical Society held four meetings during the year. On June 4th we met at LaMoure at which meeting Drs. Miller and Ribble gave a detailed report on the refresher course held at the University of Minnesota. There were seven members present.

On October 7th at Oakes the Doctors were entertained at a dinner given by the Sisters of Mercy Hospital. At this meeting there were a few visitors present, and Dr. F. E. Smith of the Lederle Laboratories gave a lecture on Pneumonia with the help of movies. There were eight members present.

On December 22nd, the Society met at Edgeley and after a dinner, Dr. L. W. Larson explained the whole time Secretary problem. Seven members were present. The last meeting of the year was held in Ellendale. At this meeting Drs. Paul Bunker and Calene of Aberdeen, S. D., were present. Dr. Bunker addressed the Society with some interesting films of foreign bodies in the bronchi and also films of sinus infection with special reference to the mastoid and its diseases. Dr. Calene lectured on the meaning of electrocardiograms.

We feel that the programs this year were very instructive and that there has been an increased interest among the members of this Society. The meetings were well planned by the President and Secretary. To those of us who have been more or less regular in attendance at our meetings in the past, it is a source of satisfaction to see that the Society is active and that even better meetings will no doubt be held during the coming year.

Respectfully,

Signed: G. B. RIBBLE, M.D.,
Councillor, Eighth District.

Tenth District

As Councillor of the Tenth District, I beg to submit the following report:

The Southwestern District Medical Society has enjoyed a very pleasant and profitable year. We have held four regular meetings, all of which were well attended.

On the evening of August 3rd, we enjoyed a very interesting talk by Dr. J. A. Curran, Dean of Long Island Medical College of Brooklyn. We have to date, 15 paid-up members, but hope this number will be increased before the State Medical Meeting. There are seven more who are eligible but who have not yet paid their dues.

Signed: A. E. SPEAR, M.D.,
Councillor, Tenth District.

The reports of the Councillors were referred to the proper Reference Committee.

REPORTS OF STANDING COMMITTEES

Committee on Medical Education

Your Committee on Medical Education can report only in terms similar to those of its reports for the last few years. Because of distance and expense the committee has had no formal meeting, but the chairman has been in contact with the other members by conference and correspondence. The general plan of the School of Medicine and the difficulties that it has encountered with the rating bodies in the last few years because of lack of support are well known to you. The last session of the Legislature made an appropriation that would seem to be about the same as was finally made available in the biennium just closing. The total appropriation this year was not quite so large, but because of a technicality in the form of the appropriation two years ago, not all of the money tagged for the School of Medicine could be used.

In the meantime, the School continues to operate as on probation, the status announced by the Council on Education of

the American Medical Association two years ago. The demand for admission, the size of classes, and the routine work are going on as before. All of the students who completed our curriculum in 1940 were accepted in other schools and are continuing their training elsewhere. The second-year class of this year numbers 21, and at this time 17 have already been offered places in other schools. Six of the class that finished the work in June, 1940, chose to write upon Part I of the National Board Examination at that time; all of them passed in all of the subjects.

Signed: H. E. FRENCH, M.D.,
Chairman.

Necrology Report

Prepared by Dr. James Grassick, Grand Forks

It becomes us to halt and bow our heads as we pay this, our tribute of memory, to those of our Fellows who since last we met, have ceased from their labors; for the night cometh when no one can work.

We miss them for their fellowship; their kindly greetings and their words of wisdom; we honor them for their sterling worth, loyalty to the profession and for the part they unselfishly played in serving stricken humanity; and we extend to those near and dear, who mourn their passing, words of sympathy and thoughts of deep concern.

* * *

J. G. DILLON, M.D.

Dr. J. G. Dillon was born at Sterling, Illinois, and died at Fargo, North Dakota, March 17, 1941, age 63 years. He was graduated from Hahnemann Medical College, Chicago, in 1904, and the following year began practice in Fargo, North Dakota. Here he lived and carried on to within a year of his death. Dr. Dillon was prominent in church, civic, and fraternal organizations. His widow and one son survive.

JAMES P. WIDMEYER, M.D.

Dr. J. P. Widmeyer was born at Ayton, Ontario, December 9, 1869, and died at his home, Rolla, North Dakota, March 17, 1941. Dr. Widmeyer was graduated from the College of Physicians, Chicago, April 2, 1896, and began the practice of his profession at Rolla, North Dakota, the same year. Here he made his home and for 45 consecutive years, with a break of only one year, gave a quality of service to the community that was outstanding. He was public spirited and gave freely of time, talents, and means for social and civic betterment. He was a past president of his District Medical Society, Director of Mt. Pleasant School Board, and Chairman for many years of the County Board of Health.

When the North Dakota Tuberculosis Association was opened in 1912, Doctor Widmeyer was appointed as its Superintendent. It was his privilege to watch from the sidelines and see the institution grow in efficiency from humble beginnings to one of the finest of its kind anywhere.

The passing of such worthy, capable veteran pioneers leaves gaps not easily bridged. He is survived by his widow, two sons, Drs. L. J. and D. L., and two grandchildren to whom he left the record of honorable service and work well done.

ARTHUR AUGUSTUS WHITTEMORE, M.D.

Dr. A. A. Whittemore was born at Belle Plaine, Minnesota, September 19, 1874, and died at Wishek, North Dakota, August 6, 1940. His ancestry goes back to the Pilgrims who came to America in 1641.

Dr. Whittemore was graduated from Hamline University in 1903 and was licensed in North Dakota the same year. He was a member of Phi Rho Sigma Medical Fraternity. He practiced respectively at Cathy, Leeds, White Earth, Bowman, Napoleon and Wishek, all in North Dakota. In 1923 he was appointed by Governor R. A. Nestos as the first whole-time Health Officer of the State, which position he held until June 30, 1933, where his talents of organization and detail work stood him in good stead.

He was a Captain in the World War U. S. Medical Corps and was stationed at Camp Greenleaf, Georgia, and discharged December 20, 1918. He was one of the organizers of the Southwestern Medical Society and its Secretary 1911-1923. He always gave the best he had to the matter in hand, and the

medical profession was better because of his devotion and loyalty.

Dr. Whittemore leaves his widow, four daughters and two sons who have been left a rich legacy of pleasant memories.

CLYDE EARNEST STACKHOUSE, M.D.

Dr. C. E. Stackhouse was born in Montezuma, Iowa, December 14, 1885, and died at Bismarck, North Dakota, December 26, 1940. He was graduated from Northwestern University in 1910 and licensed in North Dakota the same year. He began practice in Bismarck and was associated with Dr. A. M. Fisher and later with Dr. R. W. Henderson.

For the past 28 years he had taken a leading part in the medical and civic life of the community.

For 25 years he was County Physician for Burleigh and for a number of years served as physician and surgeon to the State Penitentiary. He also was health officer for Bismarck for 10 years. In addition, he was in 1927 a member of the State Board of Medical Examiners, a local surgeon for the Northern Pacific Railroad and a past president of the State Medical Association. All of which bear evidence to the high esteem in which he was held in varied circles of human endeavor.

LESLIE GUY EASTMAN, M.D.

Dr. L. G. Eastman, late of Hazen, North Dakota, was born in Minnesota, September 2, 1873, and died September 21, 1940. He was graduated in 1903 and was licensed in North Dakota the same year and located at Hazen, North Dakota, and there practiced for 36 years—and was identified with many phases of business, social and community projects.

He leaves a widow, a daughter and two grandchildren and with them many pleasing memories.

B. D. VERRETT, M.D.

Dr. B. D. Verrett of Rolla, North Dakota, was born February 16, 1876, and died May, 1940. He was graduated from Laval University in 1900, was licensed in North Dakota in 1901, and since that time was actively engaged in practice and work associated with local, state and national medical organizations, and held in high regard by all who knew him. His genial personality was a passport that admitted him to many social and civic circles.

BERNT ODEGARD, M.D.

Dr. Bernt Odegard was born at Emmons, Minnesota, June 9, 1889, and met death in an auto accident, October 25, 1940. He was graduated from Chicago College of Medicine and Surgery in 1916 and was licensed in North Dakota in 1924. He practiced for varied periods at Elgin, North Dakota; Albert Lea, Minnesota; Emmons, Minnesota; Northwood, North Dakota; and finally at Mayville, North Dakota, from 1925 until time of death. He entered the World War in 1918 and served 18 months in France with the rank of Captain. He was a member of Traill-Steele Medical Society and was a real community asset. His passing was keenly felt by those he so helpfully served.

ARTHUR RUFUS TREGO WYLIE, M.D.

Dr. A. R. T. Wylie was born in Condet, Ohio, November 5, 1871, and died at Faribault, Minnesota, March 30, 1941.

He received his Ph.D. degree from Harvard, 1898, his M.D. degree from the University of Minnesota, 1906, and licensed in North Dakota, 1911. He was Superintendent of the State School at Grafton, North Dakota, for 20 years, and during the last six years was physician at the Minnesota School and Colony in Faribault. Dr. Wylie was a psychiatrist of note and recognized as an authority on mental disorders. He honored the profession as a gentleman of culture and refinement. In recognition of his standing among his fellow psychiatrists, he was elected on two separate occasions as President of the National Association of Mental Deficiency.

He is survived by a sister, a brother, and widow, who share in a legacy of high ideals, worthy purposes and happy memories.

J. R. PENCE, M.D.

Dr. J. R. Pence of Minot, North Dakota, Coroner of Ward County, died April 29, 1941, at Minot, North Dakota, where he practiced 32 years, being associated with his brother, Dr. R. W. Pence. He served in the Medical Corps of the World War.

He was a man of the open and was active in sportsmen's

organizations. He was an expert trap shooter, and held several state championships.

He was a former City Health Officer and was active in civic and social functions and in fraternal organizations.

He is survived by Mrs. Pence, two children, John and Mary, and two brothers.

Committee on Medical Legislation

Your Committee on Medical Legislation held a meeting in Grand Forks last November. At this meeting we discussed the prospects of introducing a Basic Science Bill at the coming session of the Legislature. We too had under consideration a bill to increase the penalty for practicing medicine without a license, and a Quo Warranto Bill, which would make it possible to bring a civil action against a violator of the Medical Practice Act instead of a criminal action through the states attorney as the law now requires.

At Bismarck we held several committee meetings to discuss what was going on up at the Capitol. Soon after arriving at Bismarck, I was confronted with another of the often introduced Naturopathic Bills. This was killed in the Ways and Means Committee of the House. There was an attempt made three different times to get it on the floor of the House but each time it was defeated.

Your Committee decided that it would be unwise at this time to introduce the Basic Science Bill or the other two bills that had been proposed.

I wish to express my appreciation at this time to the members of our profession, Senators Stucke and Drew and Representative Arneson who fought for our interests while serving as members of the 1941 Legislature. Their task was not easy, too often it was unpleasant, but they remained true to the cause and performed invaluable service to us all. I wish to express as well, my gratitude to Secretary Larson for his very efficient help. We owe these four doctors a vote of thanks.

Signed: W. C. FAWCETT, M.D.,
Chairman.

Committee on Tuberculosis

The last meeting of the Committee was held at Minot, North Dakota, during the last meeting of the State Medical Association. A good representation was present and the following program was suggested:

1. It was decided that the price of X-ray films taken by physicians in the State to be paid for by the Anti-Tuberculosis Society, should be \$5.00. In order to insure checking of all contacts with the State Health Department, all films were to be sent to the State Sanatorium for diagnosis. Dr. Northrop agreed to render this service gratis. No film would be paid for unless this procedure was followed.
2. It was recommended that as far as possible, all contacts with active cases of tuberculosis should be examined; the members of the Committee to cooperate with local physicians and the State Health Department in assuring that this would be done.
3. It was decided that we should discourage the wholesale examination of school children or other similar groups because it was felt that with our limited funds, better results would be obtained in limiting the active work to contacts this year.
4. It was recommended that the State Health Department make an effort to obtain some active cooperation from the United States Government in remedying the tuberculosis situation among Indians, about which up to the present, nothing has been done.
5. It was recommended that each component medical society devote one program to tuberculosis.
6. It was recommended that contact be made with the State Superintendent of Instruction in order that examinations could be carried out in teachers' colleges and eventually some program be arranged which would require the examination of all applicants for teachers' positions in the schools of North Dakota.

So far this year, most of these objectives have been put into effect, with the exception of the last mentioned. In addition to this, the Committee has enjoyed unusual cooperation from

the Anti-Tuberculosis Society and from the State Health Department.

Members of the Committee have appeared on P. T. A. programs and programs given by the component medical societies and on radio broadcasts sponsored by the Campaign for Early Diagnosis for Tuberculosis.

In conclusion, it is our impression that a great deal of constructive work has been done and good results have been obtained. It is our recommendation that the personnel of the Committee remain the same, because only in this way will the enthusiasm of the members of the Committee be enhanced and continue.

Signed: J. O. ARNSON, M.D.,
Chairman.

Editorial Committee on Official Publication 1941

It is with some chagrin that we report little has been done by this Committee in the past year, which was the situation a year ago also. For two years no problems or questions have been submitted to this Committee, except the editing of two manuscripts and the Proceedings of the State Medical Association. From this lack of work, it appears that this Committee is, in all probability, a superfluous one.

In conclusion, we wish to report that the relationship between the Medical Association and the JOURNAL-LANCET is satisfactory, and no changes are recommended.

Signed: J. O. ARNSON, M.D.,
Chairman.

Committee on Cancer

The Committee on Cancer has continued the program adopted in recent years. Since its members constitute four of the six members of the Executive Committee of the North Dakota Division of the Women's Field Army of the American Society for the Control of Cancer, it is responsible for the policies and success of this lay organization.

Mrs. J. W. Snyder of Fargo is the State Commander of the Women's Field Army and is doing a splendid job of organizing the women in every county. These women, with the advice and cooperation of a physician who is called the Educational Director, are carrying on a campaign of Cancer Education and enrolling members at \$1.00 per membership. Seventy cents of every \$1.00 goes to the State Division to be spent under the direction of the Executive Committee.

Although the House of Delegates has given its approval of this Organization, and its aims, there are many physicians in the State who are not sympathetic to it. A few refuse to give the local county unit any assistance. Such an attitude serves only to dampen the spirits of the women who are trying to do something to decrease the misery and death rate from cancer. We urge all physicians to interest themselves in the Women's Field Army and to assist its workers in every way possible.

Your Committee has again urged the District Medical Societies to stress the subject of Cancer at least once a year. Since laymen are being taught the importance of periodic physical examinations and the danger signals which may mean cancer, physicians must be prepared to make an early diagnosis of cancer, and prescribe proper treatment. If they are not so prepared, the cancer control program will lag and more serious than this, the confidence of the public in the Medical Profession will suffer.

Respectfully submitted,
Signed: L. W. LARSON, M.D.,
Chairman.

Committee on Fractures

It was impossible for the members of the Fracture Committee to hold a meeting during the year, inasmuch as this Committee had no funds with which to finance such a meeting. However, it has been decided to hold our annual meeting in Grand Forks on May 18, 1941, in connection with the annual meeting of the State Medical Association.

The Fracture Committee has made up the following program which is to be worked out throughout the State:

1. There should be a Fracture Committee in every hospital. This Committee should review all fractures treated in the hospital and make a report at the monthly staff meetings.

2. The Red Cross should be urged to continue the emergency stations on the highways together with personnel training.
3. A portion of the program of our State Medical Association Meeting should be devoted to the subject of fractures. Likewise, the district medical societies should devote one meeting each year to a discussion of the care and treatment of fractures.

Dr. Angus Cameron represented the Committee at the Fracture Program of the American College of Surgeons Meeting in Minneapolis in March, 1941.

Respectfully submitted,
Signed: R. H. WALDSCHMIDT, M.D.,
Chairman.

Committee on Medical Economics

During the past year this committee has been relatively inactive, no formal meetings having been held. At different times during the year informal discussions and some correspondence has been carried on between the chairman and various members. No major problems have been presented for action and it seems apparent that the economic situation of the profession in the state has improved during the past year.

Welfare Boards: Most county welfare boards have been hampered by a lack of funds and it appears that in many instances it has been necessary for the profession to revert to its traditional policy of caring for indigents on a charity basis.

F. S. A.: At the meeting last year this committee was authorized to continue negotiations with the F.S.A., whereby some assistance could be given to indigent farm families in need of medical care. This was done, but a satisfactory plan could not be developed, that is to say the F.S.A. will not entertain any proposals modifying their proposals presented and rejected by us last year. At the present time the F.S.A. will, in certain standard loan cases, make an individual grant to cover medical and hospital services. As these are all on an individual basis the amount of the grant will necessarily vary. The F.S.A. have in use a certain so-called Guide for Payment of Medical Fees, which we interpret as a fee schedule. Your committee has protested vigorously, both by letter and verbally, against the use of any fee schedule other than one approved by our Association. It is a little hard to determine just what use is made of this so-called Guide in various offices, but it seems that in many cases it is not actually being used as a fee schedule. This committee believes that further representations to the F.S.A. will probably not be effective in this matter. It is suggested that as such grants are on an individual basis our members will wish to adjust their fees according to the circumstances of each case, disregarding any arbitrary suggestions contained in a schedule which not having been drawn up or approved by our Association cannot be binding on our members.

Your committee stands ready to resume negotiations with the F.S.A. whenever it seems desirable or whenever a substantial number of the profession feel that we should do so.

Antituberculosis Association: At the request of the North Dakota Antituberculosis Association a fee schedule was submitted to them. This is for tuberculosis prevention work and the funds are secured through the sale of Christmas Seals. The following is the fee schedule submitted:

1. Mantoux Tests—\$2.00.
2. Physical Examination—\$3.00.
3. Pneumothorax refills to include fluoroscopy—\$5.00.
4. One flat chest X-ray—\$5.00.

The chairman of the tuberculosis committee and executive secretary of the Antituberculosis Committee felt that the X-ray charge should be set at \$4.00. At the suggestion of the secretary this matter is referred to the House of Delegates for appropriate action.

Your committee has kept in touch with various pre-payment medical care plans elsewhere. In general it may be said that their path has been beset with many difficulties and in some instances they have had to be abandoned. It is not felt that any plan of providing medical care on a prepayment basis is likely to succeed in North Dakota at the present time. On the other hand there has been a significant growth in hospital insurance during the past year, much of it being written by private companies. The North Dakota Hospital Association are

to be commended for their efforts in bringing the benefits of hospital insurance to North Dakota.

Respectfully submitted,
W. A. WRIGHT, M.D.,
Chairman.

Supplementary Report of the Committee on Medical Economics

(Meeting held in Ryan Hotel, May 18, 1941.)

Mr. E. A. Willson presented the following matters for the consideration of this Committee.

In cases receiving Old Age Assistance, aid to dependent children and aid to the blind, the Welfare Board plans to enable them to pay for their own medical care by an increase in the amount of the grant they are receiving. The client will receive this increased amount, which he is obligated to pay to the doctor, or hospital. The Welfare Board can not make this collection.

Blind Program: Mr. Willson stated that the Blind Program was being expanded to include cases who might reasonably be expected to become blind if not treated. Under "Aid to the Blind Program", treatment will be provided for such cases.

Mr. Willson stated that where an applicant for Old Age Assistance had any tangible assets, such as land, the Welfare Board took a lien against it.

F.S.A.: The so-called "Guide for Payment of Medical Services" used by the F.S.A. when making individual grants for medical care was discussed. The Committee reiterated its opinion that doctors should ignore this schedule completely.

The question of the formation of local county or larger pre-payment medical care groups under the standard F.S.A. plan was discussed further and the Committee recommends as follows:

"That the Economics Committee continue to study proposals for prepayment plans and that county groups or societies consult with this Committee regarding the putting into operation of any such plans.

The Committee favored the appointment of another Committee to make a study of Medical Service Plans as outlined in the Secretary's report.

Favored \$5.00 for X-ray, Anti-Tuberculosis Society.

Amendments to Social Security Acts: Mr. Willson mentioned the following amendments to the Social Security Act, which are currently being proposed.

1. An amendment whereby the Federal Government will supply money to be matched by state money, to pay for medical care for social security clients.
2. An amendment whereby the Federal Government will supply funds as above to provide Medical care for all indigents.
3. An amendment to provide funds for a comprehensive system of State Medical Care.

(It was suggested that the Medical Society memorialize Congress in favor of 1 and 2. This Committee feels that at the present time we do not have sufficient information as to the substance of the proposed amendments to act on them.)

Medical Consultant: The Public Welfare Board must have a consultant for part time work as medical consultant to the Crippled Children's Programme and to the Welfare Board.

The Economics Committee approves in principle the appointment of a Medical Consultant for the Crippled Children's Programme, preferably someone connected with the State Health Department. The same person to serve as Medical Consultant to the State Public Welfare Board.

A communication from the Public Health Committee asking for clarification of the status of W.P.A. workers, insofar as the provision of medical care by official agencies was concerned. Mr. Willson pointed out their status is the same as a person having private employment and earning a similar amount. They may, or may not, receive assistance to purchase medical care from the local Welfare Board, depending on the circumstances and also largely on the funds available.

Committee on Maternal and Child Welfare

To the House of Delegates of the North Dakota State Medical Association in Annual Meeting in Grand Forks, North Dakota, May, 1941.

The provisional maternal death rate in North Dakota for 1939 is 2.3 per 1,000 live births. This appears to be an improvement over 1938, when our rate of 2.4 was the lowest in the United States. Figures for 1940 are not yet available but a preliminary survey indicates a further decline in maternal deaths.

There was a decline in the number of deaths from puerperal sepsis, from abortion with sepsis and from the toxemias of pregnancy in 1939. Your Committee would commend the more conservative management of the toxemias of late pregnancy which is indicated from recent analyses. The use of the curette is still all too frequent in cases of abortion with sepsis but modern chemotherapy, together with blood transfusions and dextrose-saline solutions are being used effectively and much more frequently in cases of puerperal and postabortal sepsis.

Your Committee would call your attention to one defect which is contributing to maternal mortality—the lack of adequate obstetric consultations. Pathologic obstetric cases are being admitted to our hospitals in increasing numbers. This increases the responsibility of the Medical Staffs and the Hospital Managements. Staff rules should be made and enforced which would protect the patient, the physician and the hospital, by making consultation mandatory before cesarean section. We would urge more obstetric consultations, not only in deciding for or against cesarean section, but in cases of dystocia, in the graver toxemias of pregnancy and in cases of obstetric hemorrhage. A free use of consultation privileges in hospital obstetric practice would improve the friendly relationships between physicians, and enhance the obstetric knowledge of all concerned. The General Hospital, with its maternity department and its organized staff, can and should become a teaching hospital for its own staff members. One way to develop this is by consultations. The ultimate good to the patients concerned may be immeasurable.

The death rate of infants under one year of age shows a decline from 59.4 in 1935 to a provisional rate of 48.9 in 1939. The three main causes of death in this age group are prematurity, all forms of pneumonia, and diarrhea and enteritis. There has been a substantial reduction in the deaths from pneumonia and gastro-intestinal causes. Prematurity represents a complex problem. Obstetric pathology is frequently the basis for premature labor, spontaneous or induced, and birth trauma plus atelectasis are the greatest hazards to the premature infant. Cesarean section greatly increases the risk for the premature infant. We may expect a reduction in the number of deaths from prematurity: (1) When toxemias of pregnancy can be brought under earlier treatment and control; (2) When birth trauma is reduced, and (3) When there is a wider and more thorough application of the principles of modern pediatric care to the premature new-born.

During 1940, 26 North Dakota physicians attended the course in Pediatrics and 27 attended the course in Obstetrics given at the Center for Continuation Study at the University of Minnesota. A six-day course in problems in the care of the new-born and premature infant is now being arranged for North Dakota physicians for June, 1941. Because of the heavy demand for places in these courses, and because your Committee desires to make this type of postgraduate instruction available to the greatest possible number, any physicians who have been in attendance at Committee-sponsored courses within a year are not eligible for this year's courses at Minnesota. However, we have enlarged the scope of our postgraduate program by recommending to the North Dakota State Department of Health that the courses in postgraduate bedside teaching, offered by the Department of Obstetrics and Gynecology at the Iowa State University Hospital, be made available to North Dakota physicians and this has been done.

From the comparative findings of pre-school Conferences, prepared by the Maternal and Child Health Division of the North Dakota State Department of Health, we find that in 1929, 47 per cent of the mothers interviewed had made at least one pre-partum visit to a physician. In 1939, from almost the same number of mothers interviewed, 83 per cent had made at least one pre-partum visit. But of greatest significance is the fact that in 83 per cent of the 1939 group, 54 per cent

began their pre-partum visits in the first trimester of pregnancy, 30 per cent in the second and only 16 per cent waited until the third trimester before seeking pre-partum care.

In March, 1940, a sub-committee of your Maternal and Child Welfare Committee, with Dr. Paul W. Freise of Bismarck as its Chairman, undertook a study of the economics of obstetric practice in North Dakota. Four hundred sixty questionnaires sent to North Dakota physicians brought the exceptionally good return of 118 complete replies, which formed the basis of the survey. This report is worthy of careful study. It shows that the private physicians of North Dakota have met the challenge of limited financial returns by increasingly effective service to their maternity patients.

Your Committee feels that the physicians of North Dakota are in a position of leadership by having shown what organized medicine can accomplish in making Motherhood safer. The ultimate reduction of maternal deaths will probably not be reached until not over one woman in one thousand dies as the result of pregnancy or labor. This goal is not impossible.

Signed: JOHN H. MOORE, M.D.,
Chairman.

Committee on Crippled Children

The Committee on Crippled Children held one meeting in Bismarck, November 23, 1940. Your Committee has been designated "The Technical Committee of the Crippled Children's Program," and acts in an advisory capacity to the Child Welfare Division of the Public Welfare Board. This meeting was in conjunction with these Bureaus.

The corrective work has been done by the qualified Orthopedic Surgeons in the State. Since the question of who might do corrective work had been raised by some members of this Association, this matter was thoroughly discussed with the representatives of the Bureau present. It was pointed out that the Federal Department lays down stringent rules on qualifications and that the State Department had no choice in the matter. General surgeons do not meet the requirements, although they may be entirely capable of performing the work. The patients are allowed a choice of Orthopedic Surgeons in so far as it is possible to comply with the rules governing expenditures for travel.

The Orthopedic Surgeons have on numerous occasions, referred patients to local physicians or general surgeons for post-operative treatment and have at times referred actual work to a competent surgeon.

On the whole, the program in the State seems to be working out well and crippled children are receiving the care that the fund allowed will permit.

Signed: A. R. SORENSON, M.D.,
Chairman.

Committee on Radio

The Committee on Radio of the North Dakota State Medical Association begs to submit the following report.

There has been no meeting of the Committee during the past fiscal year.

The Committee has carried on correspondence with the Radio Committee of the American Medical Association as to the best way to put on a radio medical program throughout the state.

Following their suggestions, this Committee obtained a list of five, ten, and fifteen minute talks approved by the Radio Committee of the American Medical Association. We obtained these lists in sufficient quantities so that a complete list was sent to each of the secretaries of the various district societies.

We have had reports from several of the societies stating that due to pressure of other matters, they were not attempting to put on any radio programs this year.

From the remainder of the societies we have had no reports and so assume that no medical broadcasts have been made.

It is the hope of the Committee that a more active participation in the broadcast of radio medical literature be made next year.

Very respectfully submitted,

Signed: A. C. FORTNEY, M.D.,
Chairman.

Committee on Venereal Disease

Meetings were held in Bismarck in August, 1940, and in March, 1941. Your Committee advised with the State Public Health Department on its Venereal Disease program. All changes in the program have been sent out to the Medical Profession over the entire state, informing them of changes.

The principal changes at present are that in the Control Payment plan a fee of \$2.00 is paid for reporting patients with syphilis that are pregnant and are under treatment instead of the usual \$1.00 fee for ordinary syphilitic cases. The Committee also approved of the department sending out sulphathiazole in the treatment of gonorrhoea cases.

We also gave our approval to the carrying on of a campaign against Venereal Disease in industrial plants.

Another group of men were sent to the University of Minnesota Extension Course on Venereal Disease.

It was called to the Committee's attention that the syphilitic problem was greatest in and around Indian reservations; as these are under government control and the Department of Public Health has no jurisdiction over these areas, any change in condition there will necessarily come through the Federal set-up.

Our relations with the Public Health Department have been very happy and it has been possible to discuss all angles of this problem, controversial and otherwise, in complete frankness.

An attempt will no doubt be made in the near future to have available in certain centers culture diagnosis of gonorrhoea.

A broad and liberal interpretation of what are considered infectious cases of syphilis is expected to result in more complete reporting of venereal diseases.

Respectfully submitted,

FRANK DARROW, M.D.,
Chairman.

Committee on Pneumonia Control

The Committee on Pneumonia Control met with members of the State Department of Health in the Capitol Building in Bismarck on December 15, 1940. Dr. Maysil Williams, State Health Officer, Dr. Frank J. Hill, Director, Division of Preventive Diseases, and Melvin E. Koons, C. P. H., Director, Division of Laboratories, represented the State Health Department.

The Pneumonia Control Program was first established December 15, 1939, by the State Department of Health, in conjunction with an advisory committee from the North Dakota State Medical Association. At that time sulfapyridine and anti-pneumococcal serum were made available free of charge to the medically indigent pneumonia patients of the state through their family physicians. Clinical laboratories throughout the state, other than the State Laboratories in Bismarck and Grand Forks, were designated to act as typing stations and depots for distribution of sulfapyridine and serum. A fee schedule for laboratory work done by the private laboratories was agreed upon, and a technician from each laboratory attended a two-day course of instruction in one of the State Public Health Laboratories.

The program, originally inaugurated for a six months' demonstration period, from December 15, 1939, to June 30, 1940, was continued throughout the year, and revealed some startling results. The facilities of the program were employed by 109 physicians. There were 959 cases of pneumonia reported, which is approximately three times the number of cases compared with former years. Of the total cases reported 384, or 40 per cent were registered with the Control Program whereas 575, or 60 per cent, were treated in the non-indigent group.

Cases seemed to be reported more promptly since the inauguration of the program, the peak in reported cases occurring in March as compared with April in other years. Fifteen per cent more cases were reported in males than in females. Seventy-five per cent of the patients were treated in hospitals, and 25 per cent in the home. In previous years the ratio of reported cases of lobar pneumonia to bronchopneumonia was about equal. In the past year there were two and one-half times as many lobar pneumonia cases as bronchopneumonia cases.

During the period from January 1 to November 1, in 1940, 188 deaths from all forms of pneumonia were recorded in residents of this state. One hundred eighty-three, or 97.3 per cent of the total deaths, occurred in the non-indigent case group, compared with 5, or 2.7 per cent of the total deaths, occurring in those cases registered under the Control Program. Fifty-seven per cent of the deaths occurred in males and 43 per cent in females. The case fatality for the total group of 959 cases was 188 deaths, or 19.6 per cent. In the non-indigent group there were 575 cases, with 183 deaths, or a fatality rate of 31.8 per cent. In the group registered with the Control Program there were 384 cases, with 5 deaths, or a case fatality rate of 1.3 per cent.

The predominant types of pneumococci found in the Control Group were Type II in 26.3 per cent, Type I in 21.7 per cent, Type VII in 8.4 per cent, and Type III in 6.7 per cent. One hundred and eight patients received an average of 50,000 units of serum. There were 344 patients who received an average of 21.6 grams of sulfapyridine per case. Of the 384 Pneumonia Control Program cases the pneumococcus type was determined in 239, or 64.8 per cent. Pneumococci failed to grow in all blood cultures sent to the State Laboratories. The per patient cost of the program was approximately \$25.00, and it was estimated that at least 212 lives were saved.

The committee agreed unanimously that the Pneumonia Control Program should be continued by the State Department of Health for the year 1941, and that the pamphlets sent out to physicians the year previously need no revision. It was advised that the pamphlets be made available at control stations. The patient's eligibility for treatment under the program is to be decided by the physician, and a certificate of medical indigency is to be secured from the local Welfare Board, if possible. However, the State Board of Health will accept the physician's statement that the patient's financial status is such that he is entitled to receive the therapeutic agents and laboratory services offered under the Pneumonia Control Program. This fact should be impressed upon physicians at the meetings of the District Societies.

Physicians are to be urged to report all cases of pneumonia to the State Health Department. The high fatality rate of 31.8 per cent in the non-control group as compared to a fatality rate of 1.3 per cent in the control group, suggests that more detailed information should be obtained regarding treatment of non-indigent patients for comparison of results of therapy in both groups. Therefore, the State Health Department will send each physician who has reported a case of pneumonia not treated under the Control Program a card to be filled out to obtain this more detailed information.

In order to keep laboratory procedures standardized a conference for technicians of the various control stations was approved. The New Rockford hospital was designated as an additional typing station after the technician attended the technicians' conference.

Since the supremacy of sulfathiazole over sulfapyridine had not been definitely established this drug was not added to the list of medicaments for indigent pneumonia cases this year.

Respectfully submitted,

Signed: PAUL H. ROWE, M.D.,
Chairman.

The Reports of the Standing Committees were referred to the proper Reference Committee for consideration.

Report of the Delegate to the American Medical Association—1940

Your Delegate to the American Medical Association begs leave to submit the following report:

The American Medical Association held its ninety-first annual session in New York, June 10 to 14, 1940.

New York is to be congratulated on having been host to such a successful convention of this, the largest medical organization in the world. There was a registration of 12,864 out of a membership of approximately 117,000.

The transactions of the House of Delegates was marked by harmony and expedition. Reference committee reports were con-

sidered in a serious and earnest fashion and with few exceptions harmoniously and expeditiously dispatched.

The address of the speaker was a constructive elaboration on the activities of the organization during the past year. Homage was paid to the memory of those who died since the 1939 meeting of the organization.

Reviewing the work of the Association during the past year and suggesting some of the problems which may arise in the near future, the President of the American Medical Association, Dr. Sleyster, addressing the House of Delegates, recalled the problems which have constantly faced the organization in recent years and declared that "The American Association stands almost alone in defense of an historic system of freedom of science and its application for human welfare—a system which shows with pride a record unrivaled in the benefits it has brought to humanity."

Dr. Van Etten as President-Elect in his address referred to present dictatorial tendencies throughout the world and to the present threat of aggression as a part of a world-wide plan to destroy the democracies. He dwelt with considerable emphasis on present legislative endeavors in Washington and cited the Hospital Construction Bill, the Wagner-George Bill now before Congress and mentioned by way of emphasis that statements had been recently made in Washington that the Hospital Construction Bill is considered the first step in a comprehensive federal health plan, and that it will lead to other steps in that direction in the near future.

War emergency sentiment was reflected in four resolutions introduced into the House of Delegates, the Association's democratic policy making "medical parliament," representing 117,000 American physicians.

The House adopted a resolution calling for unwavering support of the President of the United States in his stand on the need for national unity and organization in any possible emergency. The delegates admitted the necessity of surrendering a measure of freedom under military necessity, but contend that freedom should be restored after the emergency has passed.

A resolution for medical mobilization was adopted, approving of a tentative plan for the procurement of professional personnel for the medical corps of the U. S. Army. The plan was prepared in the office of the Surgeon General of the Army and presented to the House of Delegates by the military delegate from the Army. We quote the resolution:

1. The American Medical Association to be asked to conduct a survey of the medical profession throughout its state and local societies.
2. The local or county societies to canvass their members to determine of those who express a willingness to serve, who should be available for the military service and who, on account of their age, physical disability, or commitment in civil capacities should remain at home.
3. The county society to give to each one who expresses his willingness to serve, even though he may be selected to remain at home, a button similar to that which was designed for the Volunteer Medical Service Corps during the last war.
4. The county societies to list those who are selected for the military service according to their professional qualifications, listing as surgeons, psychiatrists, etc., only those who are members in the National Specialists' organizations. Also, to select from those who are to remain at home, qualified men for examination boards.
5. The state societies to maintain an available roster of their members.
6. The American Medical Association to maintain a numerical roster of availability by states.
7. The Medical Departments of the Army to have one or more selected officers on duty at headquarters of the American Medical Association in Chicago.
8. The War Department, Corps Areas, or regional officers to call upon the American Medical Association for physicians or specialists, as and when required.
9. The American Medical Association to call upon the

states, according to their quotas, for the physicians required.

10. The state, in turn, to call upon its local societies for its quota of physicians. "In the quotas, credits would be given for sponsored units, and preference would be given to reserve officers whenever their qualifications warrant."

AVOIDS COMPLETE LOSS

"It appears that in the event of a national emergency of great magnitude that it would be very necessary to conserve the medical profession. This plan would distribute the professional load and, if properly administered, should prevent the stripping of rural and isolated communities of their necessary medical personnel.

There could be an extension of this plan to cover the training program for technicians. The same societies could conduct a survey of the teaching institutions to determine their availability and suitability for the training of such enlisted specialists as would be required. Rational medical service for civilian groups in war industries could be coordinated by the same administrative units."

A resolution on medical preparedness introduced by the Chairman of the Board of Trustees as follows:

WHEREAS, the ravages of war again pervade many of the nations and peoples of the world; and

WHEREAS, the President of the United States has indicated to the Nation and to the Congress the desirability of military preparedness so that our people may successfully resist attempts to substitute other forms of government for the democracy established by the Constitution of our Country; and

WHEREAS, organization of the Nation for preparedness involves from the first the complete cooperation of the physicians of the country for,

1. Medical services in the Military, Naval, Aviation, and Veteran's Administrations;
2. Selection of men physically fit to serve with such agencies; and
3. Rehabilitation of those not physically qualified to participate in military activities; and

WHEREAS, Preparedness demands also

1. Medical service to the industrial workers engaged in war industries;
2. Continuance of medical care of the civilian population;
3. Education of young men to qualify them for medical service; and

WHEREAS, The American Medical Association now embraces in its membership more than 117,000 of the licensed physicians of the United States; and

WHEREAS, The headquarters facilities of the American Medical Association has available:

1. Complete records of all qualified physicians, largely their availability for military or other services;
2. Complete information concerning facilities for education in medicine, the medical specialties, and other medical activities;
3. Complete information concerning the hospitals for the United States;
4. The necessary facilities for making prompt contact through addressing devices periodicals, and constituent bodies with all medical personnel and medical agencies; and

WHEREAS, Only in the headquarters of the American Medical Association, as far as is known, are such information and facilities available; and

WHEREAS, The American Medical Association is not only the largest but also the only organization containing in its membership qualified physicians in every field of medical practice; and

WHEREAS, During the World War of 1914-1918 the American Medical Association aided in making available the services of more than 60,000 physicians for military and related activities; therefore, be it

RESOLVED, That the House of Delegates authorize the Board of Trustees to create a Committee on Medical Preparedness, to consist of seven members of this House, with the President of the Association, the Secretary of the Association, the Secretary

of the Board of Trustees, and the Editor as ex officio members; and be it further

RESOLVED, That this Committee establish and maintain contact and suitable relationship with all governmental agencies concerned with the prevention of disease and care of the sick, in both civil and military aspects, so as to make available at the earliest possible moment every facility that the American Medical Association can offer for the health and safety of the American people and the maintenance of American democracy.

A resolution was introduced in the interest of the American Medical Women's Association, calling upon the Government to extend recognition to women physicians in the form of commissions and ratings, as in the case of male physicians.

A resolution on the care of needy physicians was as follows:

WHEREAS, The care of physicians who are in need is a subject worthy of the attention of the constituted units of organized medicine; and

WHEREAS, a serious study and survey of this problem is definitely indicated; now be it

RESOLVED, By this House of Delegates of the American Medical Association that the Speaker of the House of Delegates be instructed to appoint a committee of three to make a study of the problem of (1) aid to needy members of the Association, and (2) establishment of a national fund for this purpose, and to submit a report of this study with recommendations at the next Annual Session of the House of Delegates.

A resolution from Mississippi cited the fact that Senator Bilbo of that state, had introduced into the Senate of the United States, a resolution declaring June 22nd as "Doctors' Day," in recognition for the services rendered by the medical profession to the people. A resolution from Alabama, called for the closest cooperation between the medical profession and the health authorities in the effort to control venereal diseases, and recommending that physicians who serve in the various venereal disease clinics be compensated for their services.

A resolution calling upon constituent State Associations and component County Medical Societies, to work out plans whereby some protection would be given the practice of physicians called into the service, and perhaps some remuneration therefrom.

A request was received from the National Medical Association, the national organization of Negro physicians, that negro physicians be included in any plans set up for the procurement of physicians for the armed forces in the anticipated emergency.

Another matter which received careful consideration at the hands of both the house and of its reference committee on legislation and public relations was the Federal Hospital Construction Bill which had been radically altered in the Senate Committee to which it had been referred and had passed the Senate. While approval was given to the broad principles embodied into the bill, several suggestions were offered as to how the bill might be improved. Strong objections were interposed, to a last minute amendment written into the bill by Senator Murray from the floor, which included the osteopathic profession as one of the groups from which the eight members of the national advisory council may be selected.

The House rejected a plea from Louisiana to endorse repeal of some of the restrictions placed on heroin by the narcotic law.

(The American Medical Association has long held that heroin is not indispensable as medicine.)

The exhibits, both scientific and technical, were most extensive and interesting; and, for the many who concentrated upon them, proved a valuable asset in stimulating a thirst for newer, scientific knowledge.

Two hundred and fifty papers were scheduled for delivery before the various general and scientific sections, many of them illustrated by scientific exhibits which numbered nearly two hundred and fifty, covering the entire floor of the Grand Central Palace.

Every third year in accordance with the provision of the By-Laws a reapportionment of delegates has to be made. This was done at the 1940 Session on a basis of one delegate from

each state for every 930 members or a fraction thereof. The total membership of the House, including representation from the three federal services and the various sections is limited to 175; also at this Session a new section on Anesthesiology was created, making the total number of sections now, sixteen.

This reapportionment resulted in a gain of one delegate for four states, with a corresponding loss in four other states.

Three names were submitted by the Board of Trustees as candidates for the distinguished service medal and citation. From the names submitted one candidate could be elected. The honor was bestowed upon Dr. Chevalier Jackson of Philadelphia, now 74 years of age and whose outstanding contributions in the field of bronchoscopy are known wherever scientific medicine is practiced.

Without opposition, the House selected as President-Elect Dr. Frank H. Lahey, of Boston, who has long been identified with the Association's activities in the field of graduate education.

Dr. W. F. Braasch, of Rochester, Minnesota, was elected a member of the Board of Trustees to fill the vacancy created by the recent untimely death of Dr. Charles B. Wright of Minneapolis. No other changes were made in the Board of Trustees.

Respectfully submitted,

Signed: A. P. NACHTWEY, M.D.,
American Medical Association Delegate.

This report was referred to the proper Reference Committee for consideration.

REPORT OF SPECIAL COMMITTEE Committee on Medical Preparedness

The House of Delegates of the American Medical Association, at its meeting in New York City in June, 1940, passed resolutions which placed the records and facilities of the American Medical Association at the disposal of the United States Government and authorized the creation of a Committee on Medical Preparedness, to Cooperate With The Council on National Defense, the Army, Navy and United States Public Health Service, and All Other Federal Agencies in Preparing Our Nation Medically to Meet Any Emergency. This Committee was immediately appointed. Irvin Abell is its Chairman, and Olin West, its Secretary. The Officers of each State Medical Association were asked to nominate a physician to serve as Chairman of a State Committee on Medical Preparedness. All State Chairmen were officially appointed by the National Committee.

A Committee on Medical Preparedness of the North Dakota State Medical Association, consisting of six members was appointed. Its membership consists of the elective officers of the Association. It has met twice to consider problems presented to it by the National Committee.

In order that our component district medical societies might offer assistance to the State Committee, the officers of each District Society were asked to appoint a District Committee on Medical Preparedness. The quick response to this request was gratifying and the District Committees have already decreased the burden placed upon the State Committee by furnishing needed information and recommendations.

In order that the Medical facilities available to the Government in the event of war might be determined, the National Committee sent a questionnaire to every physician in the United States and its possessions. The mailings began on July 5th, 1940. Since then 185,114 physicians have supposedly received the questionnaire. Seventy-seven per cent of physicians in the continental United States had returned the questionnaire by December 31, 1940, and 29 per cent of physicians in the outlying territories and possessions. The return was 92.6 per cent in North Dakota, and the Seventh Corps Area, of which we are a part, ranks second among the Nine Corps Areas. The figures upon which this estimate in North Dakota are based do not agree with those in our office, in that the American Medical Association includes the names of several physicians who we know have either died or moved out of the state. It required considerable correspondence before some of our physicians completed the questionnaire and returned it to the Chi-

cago Headquarters. The reasons for failure to comply were numerous. Some claimed they had not received it; this required the mailing of another form. Some claimed they had forwarded it, while the National Committee insisted that it had not arrived. A few admitted that they had simply neglected it. A few hesitated to send it in for fear it would entangle them in the military forces of the Nation, in spite of specific statements to the contrary. A very few persistently refuse to comply with the request or to answer our communications. However, the percentage of returns we are credited with almost equals that of the best return and is so much higher than the average throughout the Country, we have reason to feel proud of our showing.

Governor Moses requested the State Committee to nominate physicians for appointment as Examining Physicians for the County Boards of Selective Service. The nominations were made with the cooperation of the District Society Committees. We are all aware of the burden placed upon these examining physicians, who serve without pay. However, the Selective Service Act made no provision for such remuneration, and every examiner will, to date, have to be content with the satisfaction of performing a patriotic service to his country and of meriting the confidence of his fellows and of the Governor in his integrity, professional ability, and standing in the community. Additional examiners have been appointed in most counties in order to decrease the burden. Governor Moses, and General Edwards, Director of Selective Service in North Dakota, have exhibited a keen interest in this problem and have been eager to ask for help from our Committee or to comply with any reasonable request from an examining physician or our Committee.

The North Dakota Committee on Medical Preparedness is not only concerned with the collection of data, etc., for the use of the Government in the procurement of adequate medical personnel for the Defense Program, and also in the event of war, but it is greatly concerned over the preservation of adequate medical facilities for our people who remain at home. The mistakes of the last war, in which large rural areas were left without the services of a doctor, must not be repeated. Careful surveys of this situation are being made under the direction of the National Committee. Confusion has existed in the minds of many of our physicians over the policy of the Government in this respect as it affects Medical Reserve Officers. Several such officers have been called to active duty with apparent disregard for the welfare of the physician or of the people he serves. However, it must be remembered that every Reserve Corps Officer is subject to call and cannot resign unless he holds a commission beneath the rank of a Captain, and that the Reserve Corps is the only pool from which medical officers can be obtained at the present time. Enlistments have not been sufficient to supply the number needed and the Army has been forced to call Medical Reserve Officers in large numbers. This Committee has done all it could to inform the proper authorities of the peculiar circumstances of several Medical Reserve Officers in the State, who have been called to active duty, or to emphasize the desirability of deferment because the physician in question is needed for the maintenance of the civilian health in his community. A few such appeals have been given favorable consideration, but the majority have not, for the obvious reasons stated above.

The Medical Profession in the United States has an enviable reputation for devotion to duty to its country in times of war and disaster. It will not be found wanting this time, in spite of attempts made to discredit it. The State Committee on Medical Preparedness will do what it can to preserve this record.

Respectfully submitted,

Signed: L. W. LARSON, M.D.,
State Chairman,
Committee on Medical Preparedness.

This report was referred to the proper Reference Committee for consideration.

Speaker JOHN MOORE: We come to the item of fixing the per capita dues during the ensuing year. May I read to you

from the By-Laws, Chapter 9, Section 1, which reads as follows: "The assessment of \$10.00 per capita on the membership of the component societies unless otherwise ordered by the House of Delegates is hereby made the annual dues for this association. The Secretary of each district society shall forward its assessment together with its roster of all officers and members, list of delegates and list of non-affiliated physicians of the county or district to the secretary of this society not later than the first day of March in each year." That is hereby made the dues of the Association.

I want to call to your attention the matter of amendments; from the Constitution Article XIII. "The House of Delegates may amend any article of this Constitution by a two-thirds vote of the delegates registered at the annual session, provided that such amendment shall have been presented in open meeting at the previous annual session, and has been published in the official journal of the association, and that it shall have been sent officially to each component society three months before the session at which final action has to be taken." And from the By-Laws, Chapter XIII, "These By-Laws may be amended at any annual session by a majority vote of all the delegates present at that session, after the proposed amendments have laid upon the table for one session, provided that any such amendment be introduced in writing at the First Session and acted upon at the last session."

The Speaker has received no proposed amendment in writing. Is there any to be proposed at this time?

The Speaker introduced Dr. C. J. Glaspel, President of the Association.

Dr. C. J. GLASPEL: I have no remarks to make, except those which I will make to the entire Convention tomorrow. In selecting the Nominating Committee, I have given it considerable thought and study. I have tried to get men from various parts of the State so that they are represented well in so far as geography is concerned. I have tried to incorporate in this Committee men who are relatively new in the Association, and those who have wide experience in running the Association. The Nominating Committee is as follows:

Dr. P. H. Burton, Fargo.
Dr. John Fawcett, Devils Lake.
Dr. R. H. Waldschmidt, Bismarck.

Secretary L. W. LARSON: Since preparing the Secretary's Report which was printed in the Handbook and the Supplementary Report which has just been read, two items have come to our attention which should be considered by the House of Delegates. The first is that a Standing Committee on Nervous and Mental Diseases be authorized. The Secretary has received considerable correspondence from a female resident in the State regarding the method by which patients are sometimes committed to the State Asylum at Jamestown. It would seem that a change in our state laws should be made in this respect. A Committee representing the North Dakota State Medical Association could make a study of this problem and submit its findings to the law-making bodies. This Committee could also serve in an advisory capacity to the Superintendent of the Jamestown State Hospital.

The Secretary of the Council on Industrial Health of the American Medical Association requests that a Committee on Industrial Health be authorized in our Association. I do not know what the function of this particular Committee would be in this state, but inasmuch as we are the only State in the Union that does not have one, I believe such a committee should be authorized.

A motion was made to refer these two items to the Reference Committee on the Report of the Secretary, for consideration. The motion prevailed.

The Speaker announced the personnel of the Reference Committees, and the place of their meetings:

Reference Committee to consider the reports of the Standing and Special Committees: Dr. W. A. Wright, chairman, Williston; Dr. W. A. Liebeler, Grand Forks; Dr. C. J. Meredith, Valley City; Dr. Paul Burton, Fargo; Dr. C. C. Smith, Mandan.

Reference Committee to consider the reports of the council, councillors, and delegate to the American Medical Association: Dr. A. R. Sorenson, chairman, Minot; Dr. W. W. Wood, Jamestown; Dr. John Fawcett, Devils Lake; Dr. O. T. Benson, Glen Ullin; Dr. Syver Vinje, Hillsboro; Dr. A. E. Westervelt, Bowdon.

Reference Committee to consider the report of the secretary: Dr. P. H. Woutat, chairman, Grand Forks; Dr. R. H. Waldschmidt, Bismarck; Dr. A. P. Nachtwey, Dickinson; Dr. F. W. Fergusson, Kulm; Dr. Wm. Stafne, Fargo.

The Speaker announced that the Second Session would be called at 3:00 P. M. today.

The First Session adjourned at 10:00 A. M.

SECOND SESSION of the HOUSE OF DELEGATES

The Second Session of the House of Delegates was called to order by the Speaker, John H. Moore, at 3:00 P. M. Monday, May 19, 1941, in the Epworth Hall, Grand Forks, North Dakota.

The following delegates and alternates responded to the roll call:

Doctors:

Wm. Stafne, Fargo.
John Fawcett, Devils Lake.
W. A. Liebeler, Grand Forks.
P. H. Woutat, Grand Forks.
W. A. Wright, Williston.
A. R. Sorenson, Minot.
Olaf Haraldson, Minot.
C. J. Meredith, Valley City.
R. H. Waldschmidt, Bismarck.
O. T. Benson, Glen Ullin.
C. C. Smith, Mandan.
Fred Fergusson, alternate, Kulm.
Wm. W. Wood, alternate, Jamestown.
A. P. Nachtwey, Dickinson.
Syver Vinje, Hillsboro.
A. E. Westervelt, alternate, Bowdon.

The Speaker declared a quorum present.

The Minutes of the First Session were read by the Secretary and approved.

Speaker JOHN MOORE: The next order of business is the election of officers and that is dependent upon a report from the Nominating Committee. I do not see the Chairman of the Nominating Committee here. I will declare a recess until the arrival of the Chairman of the Nominating Committee.

The recess was declared at 3:30 P. M.

Interim of 15 minutes.

Speaker JOHN MOORE: Gentlemen, we have waited a reasonable length of time, and the Chairman of the Nominating Committee has not yet arrived. Is there any objection on the part of any Delegate to change the order of business, proceeding with unfinished business and having the Reference Committee reports, prior to the election. There are 16 Delegates present out of 18. If it is unanimously decided, we can change the order of business.

A motion was made that the order of business be changed, pending arrival of the Chairman of the Nominating Committee. The motion prevailed.

Report of the Reference Committee to Consider the Report of the Secretary

Dr. P. H. WOUTAT, Chairman: Your Reference Committee recommends that officers and members continue their efforts to bring all ethical and eligible physicians practicing in the State into the State Association.

Your Reference Committee wishes to commend the excellent work done by the Secretary during the past year in visiting the District Societies and call your attention to the extra load of work put on his office by the Medical Preparedness Program.

Your Committee wishes to call your attention to the close referendum vote in the matter of an increase in the State

Association dues and recommends that because of this and the increased work necessary to the proper conduct of the Secretary's office, that the question of the possible necessity for the employment of a full-time secretary at some time in the future be kept in mind.

These sections of the report were unanimously adopted.

Dr. P. H. WOUTAT: Your Reference Committee realizes the tremendous sacrifice being made by physicians who enter military service and requests a recommendation by the House of Delegates that these men be carried as active members of their local societies and that the Council find means to pay their annual dues. I move that this portion of the Reference Committee's Report be adopted.

Dr. W. A. LIEBELER: I second the motion.

Speaker: This is open for discussion. The Speaker would like to have that clarified a little. Are you recommending that the House of Delegates take action on that, or will that be covered in another point in your report?

Dr. P. H. WOUTAT: We request a recommendation by the House of Delegates that these members be carried as active members.

Speaker: Now gentlemen, if you give an affirmative vote to this recommendation, you are acceding to that. Is there any discussion? Hearing none, we will have the question. All in favor?

All "Ayes".

Opposed, "no response." The motion prevailed.

Dr. P. H. WOUTAT: Your Reference Committee wishes to recommend the adoption of the Secretary's recommendations as to designations of Councillor Districts. His recommendations are found on Page 5 of the Handbook and for the benefit of those who do not have their Handbooks, we could find only one change in his recommendations, that is, the Traill-Steele Society to be included in the Third Councillor District with the Grand Forks District Society. We were given to understand that previously that District was in the Councillor District of the Shyenenne Valley. We understand that the recommendations of the Secretary were made because of geographical conditions. The following are the Councillor Districts as recommended by the Secretary in his report:

First Councillor District—Cass County Society, Richland County Society.

Second Councillor District—Devils Lake District.

Third Councillor District—Grand Forks District, Traill-Steele Society.

Fourth Councillor District—Northwest District, Kotana Society.

Fifth Councillor District—Shyenenne Valley Society.

Sixth Councillor District—Sixth District Society.

Seventh Councillor District—Stutsman County Society.

Eighth Councillor District—Southern District.

Ninth Councillor District—Tri-County Society.

Tenth Councillor District—Southwestern District.

This portion of the report was unanimously adopted.

Dr. P. H. WOUTAT: Your Reference Committee wishes to recommend that the House of Delegates instruct the Secretary to issue Charters to the Component District Societies.

Your Reference Committee recommends that the House of Delegates elect Dr. A. T. Horsman of Devils Lake and Dr. W. F. Welch of Larimore to Honorary Membership in the State Medical Association.

These portions of the report were unanimously adopted.

Dr. P. H. WOUTAT: Your Reference Committee disagrees with the Secretary's recommendation that a Special Committee be appointed to study the matter of "Medical Service Plans" during the coming year. We recommend that the House of Delegates instruct the Medical Economics Committee to study this matter and report at the 1942 meeting of the House of Delegates. We further recommend that the House of Delegates request the Council to make available funds for this purpose. I move the adoption of this portion of our report.

Dr. A. P. NACHTWEY: I second the motion.

Speaker: This is an important matter. May we have some discussion on this. In effect, then, this recommendation would refer to the Economics Committee to study and report this matter in 1942 at the meeting of the House of Delegates.

Dr. W. A. WRIGHT, Williston: Just to get the thing straight. In our report of the Economics Committee, we recommended that a Special Committee be appointed. So, we should have a clear expression from the House of Delegates as to which report should be adopted.

Dr. A. R. SORENSON, Minot: It would strike me that it would be well to have a Special Committee to do this. The Economics Committee has quite a lot of work, and it is a large committee. It seems to me you should appoint a special committee; a smaller one to give this their personal attention.

Dr. A. P. NACHTWEY: As a member of the committee that reviewed this situation, we took that into consideration and felt that this is an economic item and it rightly belongs to the Economics Committee. We thought that by creating another committee, it would be working at cross purposes; that was our idea of leaving it as it was. The Economics Committee has done very efficient work; they have the data and the material to study this. A new committee would simply add more to it and be cumbersome.

Dr. W. W. WOOD: I believe as Dr. Nachtwey says, that it belongs to the Economics Committee. Dr. Sorenson says that that committee is too large, but that does not hamper that committee from making a sub-committee in their own ranks to study this. That would be the thing to do.

Dr. SYVER VINJE: I would like to have the question stated, so that we know what we are voting on.

Speaker: Dr. Woutat, will you read that recommendation of the Committee again?

Dr. P. H. WOUTAT: Your Reference Committee disagrees with the Secretary's Recommendation that a Special Committee be appointed to study the matter of "Medical Service Plans" during the coming year. We recommend that the House of Delegates instruct the Medical Economics Committee to study this matter and report at the 1942 meeting of the House of Delegates. We further recommend that the House of Delegates request the Council to make available funds for this purpose. I move the adoption of this portion of our report.

Speaker: Is it perfectly clear, gentlemen? If so, and if there is no further discussion, all of the Delegates who are in favor of this report, please rise.

A count revealed 12 in favor, and 2 opposed.

Speaker: I declare this portion of the report adopted.

Dr. P. H. WOUTAT: Your Reference Committee concurs in the recommendations of the Secretary that the House of Delegates recommend that a Standing Committee on Nervous and Mental Diseases be appointed by the President of the State Association, said Committee to report at the next annual meeting.

Your Reference Committee recommends that this Association comply with the request of the American Medical Association Council on Industrial Health and that the House of Delegates recommend that the President of the State Association appoint a Standing Committee on Industrial Health.

These portions of the report were unanimously adopted.

Dr. P. H. WOUTAT: Your Reference Committee wishes to commend the Secretary for his concise report and on his efficient service to the Medical Profession of the State during the past year.

The report as a whole, of the Reference Committee to Consider the Report of the Secretary, was unanimously adopted.

Report of the Reference Committee to Consider the Reports of the Standing and Special Committees

Dr. W. A. WRIGHT, Chairman: The report of the Committee on Medical Education was read and discussed. The difficulty of second year students transferring to other schools because of incomplete credits, due to examination period, was considered. No further recommendations were made. This Committee recommends the adoption of this report.

The report of the Committee on Public Policy and Legislation was read and this Committee recommends that the present Committee be continued for the next two years—and that this Committee be urged to develop a long-range policy, leading to definite, desirable legislation for the next Session. Your Committee recommends the adoption of this report.

These portions of the report were unanimously adopted.

Dr. W. A. WRIGHT: The report of the Committee on Tuberculosis was read and this Committee recommends that the Secretary send a form letter to all members of this Society informing them of the scope of the program and the fee schedule, adopted in their program of the State Anti-Tuberculosis Society and recommends the adoption of the report.

Dr. C. J. MEREDITH: I second the motion.

Speaker: Is there any discussion? As I understand it, the Committee recommends that the Secretary be instructed to send the fee schedule, adopted in their program of the State Anti-Tuberculosis Society, to every member of the Association?

The motion prevailed.

Dr. W. A. WRIGHT: I also move the adoption of the entire report.

Dr. JOHN FAWCETT: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The report of the Committee on Editorials and Publications was read. This Committee feels that it has been superfluous. We recommend the adoption of the report and the continuation of the Committee, believing full well that their efforts have been worthwhile. I move the adoption of the Report of this Committee, with the exception of the point that they consider themselves superfluous.

Speaker: The Chairman of the Reference Committee is asking that the disparaging remarks of the Committee against themselves be deleted from the Report, and that the Report be otherwise adopted.

Dr. C. J. MEREDITH: I second the motion.

The Motion prevailed.

Dr. W. A. WRIGHT: The report of the Committee on Cancer was read and discussed. This Committee recommends its adoption, and urges all physicians to cooperate with this Committee. The only thing we wish to add is that we wish the cooperation of all physicians. Your Reference Committee feels that all physicians should be urged to cooperate with this Committee.

Dr. A. P. NACHTWEY: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The report of the Committee on Fractures was read and discussed, and we recommend its adoption. Further, we draw especial attention to the Section recommending a Committee on Fractures in each hospital.

Dr. OLAF HARALDSON: I second the motion.

The Motion prevailed.

Dr. W. A. WRIGHT: The report of the Committee on Medical Economics and its Supplementary Report was read and discussed at length. The Reference Committee feels that this Committee at this time, as in the near past, is very important and that in all problems concerning this Committee, they be informed and consulted. We recommend the report for adoption. We will present this in several parts. I move the adoption of the Report on Medical Economics, as printed in the Handbooks.

Speaker: Do you include in that motion, the Supplementary Report?

Dr. W. A. WRIGHT: No.

Speaker: All right, he moves the adoption of the Medical Economics Report as it appears in the Handbook. May we have a second, please?

Dr. R. H. WALDSCHMIDT: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: Now, I would like to read the Supplementary Report again and we will take this up in sections to be acted upon.

The first section, Amendments to the Social Security Act: Mr. Willson mentioned the following amendments to the social security act which are currently being proposed:

"1. An Amendment whereby the Federal Government will supply money to be matched by State Money, to pay for medical care for social security clients.

"2. An Amendment whereby the Federal Government will supply funds as above, to provide medical care for all indigents.

"3. An Amendment to provide funds for a comprehensive system of State Medical Care. (It was suggested that the Medical Society memorialize Congress in favor of one and two. This Committee feels that at present we do not have sufficient information as to the substance of the proposed amendments to act on them.)"

The Reference Committee does not recommend that we should do so at the present time.

Speaker: May I ask for a point to be clarified? You are, in substance, asking the House of Delegates to reject the three amendments?

Dr. W. A. WRIGHT: No, I am asking them to leave it to us to decide until we get more information.

Secretary L. W. LARSON: In other words, you do not want the House of Delegates to take a stand on it now?

Speaker: Is there a second to the adoption of this Section?

Dr. A. R. SORENSON: I second this.

The Motion prevailed.

Dr. W. A. WRIGHT: "The Public Welfare Board must have a consultant for part-time work as Medical Consultant to the Crippled Children's Program and to the Welfare Board." The Economics Committee approves in principle the appointment of a Medical Consultant for the Crippled Children's Program, preferably someone connected with the State Health Department; the same person to serve as medical consultant to the State Public Welfare Board. I recommend the adoption of this Section.

Dr. O. T. BENSON, Glen Ullin: I second the motion.

Dr. A. R. SORENSON: As Chairman of the Crippled Children's Committee, I was present at a meeting in Bismarck a week ago Sunday, where this matter was brought up. They have been ducking this for three years but they must have one now or their money will not be matched. This, the question of appointment, is going to be a difficult one to decide and to make a recommendation and I understand they want an expression from the House of Delegates on this matter. This consultant will attend the Clinics as they are held in the various parts of the country; segregate the crippled children from the ill children. These can be weeded out by a medical consultant.

Dr. R. H. WALDSCHMIDT: This medical consultant is in no way authorized to prescribe treatment. He is just to give them advice, and urge them to see their family physician. This is entirely in an advisory capacity. The Federal Government says they will have to do this or they are not going to get any money.

Dr. C. J. MEREDITH: May I ask upon whom the duty of appointing this consultant evolves?

Dr. A. R. SORENSON: The Department of Crippled Children will appoint this man.

Dr. R. H. WALDSCHMIDT: The Crippled Children Bureau will pay half; the Public Welfare Board will pay the other half.

Dr. W. A. LIEBELER: For further clarification, in this matter, we discussed this thing in the Committee Meeting last evening at great length. In the Public Health Laboratories where they are under-manned and under-financed, they can not get capable men to stay there. The solution seemed to evolve around this plan that the Crippled Children's Welfare Committee would pay this man for half time, and the State Welfare Department would pay the other half. This will solve the problems of both these Departments. It might be of information to you to know that a fund of \$4,000.00 had to be turned back to the Federal Government last year because they did not have a medical consultant.

Dr. R. H. WALDSCHMIDT: As Dr. Liebler says; there is a fund of \$2,400.00; that is, they have appropriated \$4,800.00, but they are to pay only \$1,200.00 each for half time.

Speaker: To keep this question in mind, I am going to ask the Chairman to read that Section again.

Dr. W. A. WRIGHT: The Economics Committee approves in principle the appointment of a medical consultant for the Crippled Children's Program, preferably someone connected with the State Health Department. The same person to serve as medical consultant to the State Public Welfare Board.

Speaker: Will the Delegates allow me the privilege of the floor for one moment? Is there any objection if I speak? Your State Health Department is asking the endorsement of the House of Delegates before they care to consider allowing any physician of the Health Department to act in a consultant or advisory capacity. I just wanted to make that point clear.

Dr. A. R. SORENSON: I believe this recommendation covers the matter very well. I imagine that this appointment will be made at a conference which will be held in Bismarck, with the meeting of the Crippled Children's Department.

Speaker: The Health Department would be governed largely by the House of Delegates.

Dr. R. H. WALDSCHMIDT: If this is going to be the consensus of this group, we will have to alter our state laws in this respect, and request legislation to put this under Public Health.

Speaker: It will not be necessary to change the law to supply a consultant.

Dr. R. H. WALDSCHMIDT: The law would have to be changed to put the crippled children under the medical profession.

Speaker: Is there any further discussion? We will have the question. All in favor?

All "Ayes".

Opposed, "No response." Motion prevailed. This portion of the supplementary report of the Medical Economics Committee has been adopted.

Dr. W. A. WRIGHT: "A communication from the Public Health Committee asking for clarification of the status of the WPA Workers, in so far as the provision of medical care by official agencies was concerned." Mr. Willson pointed out their status is the same as a person having private employment and earning a similar amount. They may or may not receive assistance to purchase medical care from the local welfare board, depending on the circumstances and also largely on the funds available. I move the adoption of this portion of the supplementary report of the Committee on Medical Economics.

Dr. F. W. FERGUSSON: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The so-called guide for payment of medical services used by the F.S.A. when making individual grants for medical care was discussed. The Committee reiterated its opinion that doctors should ignore this schedule completely.

The question of the formation of local county, or larger prepayment medical care groups under the standard F.S.A. plan was discussed further and the Committee recommends as follows: "That the Economics Committee continue to study proposals for prepayment plans and that county groups or societies consult with this Committee regarding the putting into operation of any such plans."

Dr. C. J. MEREDITH: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The Committee favored the appointment of another Committee to make a study of medical service plans, as outlined in the Secretary's Report.

Dr. P. H. BURTON: I second the motion.

Speaker: I call your attention to the fact that it is in direct conflict with a previous report. We should have a discussion. Hearing no discussion, all those in favor, please rise; we will have a divided vote.

The count revealed five in favor; and seven opposed. The motion was therefore lost.

Dr. W. A. WRIGHT: The fee for Chest X-rays in the Anti-Tuberculosis Society is favored for \$5.00. I move the adoption of this fee.

Dr. R. H. WALDSCHMIDT: I second the motion.

The Motion prevailed.

Dr. W. A. WRIGHT: I move the adoption of the report as a whole of the Reference Committee to consider the report of

the Medical Economics Committee, except that portion which deals with the appointment of a Special Committee to study Medical Service Plans.

Dr. A. P. NACHTWEY: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The report of the Committee on Maternal and Child Welfare was read. We recommend its adoption. This Committee further calls attention to a publication in the *Journal of the American Medical Association* of May 1st, written by the Chairman of this Committee, and feels that worthwhile publicity was given this State Society.

Dr. A. P. NACHTWEY: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The report of the Committee on Crippled Children was read and motion is made for its adoption.

Dr. F. W. FERGUSSON: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The report of the Committee on Pneumonia Control was read and approved. We recommend its adoption. We further recommend that this Committee be urged to distribute sulfathiazole as well as sulfapyridine.

Dr. C. J. MEREDITH: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: I move the adoption of the entire report of the Committee on Pneumonia Control as amended.

Dr. C. J. MEREDITH: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The Report of the Committee on Venereal Disease was read. We move its adoption.

Dr. C. J. MEREDITH: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The report of the Committee on Public Health was read and its adoption is recommended with the exception of Paragraph No. 3, "That the advisability of presenting a compulsory vaccination law should be considered by physicians at this time." This Committee feels that a legislative attempt of this type at this time is not advisable.

Speaker: The Report of the Committee on Public Health was not printed in the Handbook and has not been read to the House of Delegates. Mr. Secretary, will you please read the report of the Committee on Public Health.

Secretary L. W. LARSON read the following report, which had not been printed in the Handbook and had not been ready for the First Session when other reports were read:

Report of the Committee on Public Health

1. The meeting of the Committee on Public Health of the North Dakota State Medical Association was called to order by the Chairman of the Committee, Maysil M. Williams, M.D., at 10:30 A. M., April 6, 1941, in the State Health Department Office, Capitol Building, Bismarck, North Dakota.

2. The following members of the Committee were present: Dr. Huntley, Kindred; Dr. Gumper, Dickinson; Dr. Malvey, Bottineau; Dr. P. O. C. Johnson, Watford City; Dr. Campbell, Valley City; Dr. Maysil M. Williams, Bismarck.

Dr. Owens, New Rockford, sent regrets due to his illness. Dr. Landry, Walhalla, could not attend because of the bad roads.

Dr. Frank J. Hill, Director, Division of Preventable Diseases, and Dr. Viola Russell, Director, Division of Maternal and Child Hygiene, State Department of Health, were also present.

3. An agenda was presented which included special problems in communicable disease control, public health laws of North Dakota, health education, sanitation, vital statistics, and problems in the defense program.

4. The chairman of the Committee reviewed briefly the purpose of the Committee, namely:

- (1) To act in an advisory capacity to the State Department of Health in technical matters related to public health in the State,
- (2) To interpret the program of the State Department of Health to the physicians of the State,
- (3) To study contemporary public health procedures and developments, and to make recommendations for laws, rules and regulations, relating to long range planning in the field of public health.

5. After extensive discussion, the following recommendations were made:

- (1) That the physicians of the State be urged to improve their postpartum program by seeing that the infants be immunized for diphtheria and vaccinated for smallpox before one year of age.
- (2) That physicians be urged to publicize the importance of the Schick test in the light of the number of cases of diphtheria which occurred in the State during the past year.
- (3) That the advisability of presenting a compulsory vaccination law should be considered by the physicians at this time,
- (4) That the State Health Department urge that more immunizations should be done, and that they contact all interested groups particularly those responsible for education in the State,
- (5) That the public health laws for the State be studied, revised, and amended, and that steps be taken to introduce any amendments, or revisions at the next legislature,
- (6) That no medical care program be sponsored by the State Department of Health in any limited area such as a county, without bringing the project to the district medical society covering that county for discussion and approval,
- (7) That the physicians take an active part in all health education matters in their respective communities, using all avenues open for dissemination of sound health education.

6. It was further recommended:

- (1) That the problem of closer follow-up on tuberculosis cases dismissed from the sanatorium be carried out, and that the family physician be notified when patients are dismissed from the sanatorium, and that the public health nurse or the State Department of Health assist the family physicians in influencing the patient to return for regular and frequent checks.
- (2) That all public servants, including teachers should have tests and examinations for tuberculosis.
- (3) That the reports required by the State Department of Health be simplified by having only one card for the reporting of tuberculosis which will include the report and the case history.

7. The Chairman was requested to write to the Chairman of the Committee on Medical Economics to determine the status of WPA clients and border-line cases in respect to medical care by official agencies.

8. Other topics including vitamin concentrates, pneumonia, toxemias of pregnancy, care of prematures, and the necessity for physicians interesting themselves in all public health activities were discussed.

Respectfully submitted,

MAYSIL M. WILLIAMS, M.D.,
Chairman, Committee on Public Health.

Dr. W. A. WRIGHT: I will present this in two parts; the part we recommend for adoption, and the part we do not recommend for adoption. The report of the Committee on Public Health was read and we take exception to Paragraph No. 3.

At this point Dr. Morris Fishbein, Editor of the *Journal of the American Medical Association*, was introduced to the House of Delegates.

Dr. W. A. WRIGHT: We recommend that Section 5, Paragraph 3, of the Report be not adopted.

Dr. C. J. MEREDITH: I second the motion.

The motion prevailed, and that portion of the report was rejected.

Dr. W. A. WRIGHT: I move the adoption of the remaining portions of the Report of the Committee on Public Health.

Dr. C. J. MEREDITH: I second the motion.

The motion prevailed.

Dr. W. A. WRIGHT: The report of the Committee on Radio was read and we recommend its approval.

Dr. A. P. NACHTWEY: I second the motion.

The motion prevails.

Dr. W. A. WRIGHT: I wish to move the adoption of the Report of the Committee on Necrology and Medical History.

Dr. R. H. WALDSCHMIDT: I second the motion.

Speaker: In adopting the report of the Committee on Necrology, we bear in mind the members of the Association who have left our midst because of death. As an affirmative vote on this, we request that you arise to pay tribute to the members who have passed away during the past year.

I declare it adopted.

Dr. W. A. WRIGHT: I would like to move that the entire report of the Reference Committee, as amended, be adopted.

Dr. A. P. NACHTWEY: I second the motion.

The motion prevails.

Report of Reference Committee to Consider the Reports of the Council, Councillors, and Delegate to the American Medical Association

Dr. A. R. SORENSON, Chairman: We will present our report in three sections. This Committee desires to commend the Councillors for their efficient management of the business affairs of the State Association. This Committee would recommend to the House of Delegates that it approve an action by the Council to appropriate sufficient funds to reimburse members of the Standing Committees for travelling expenses. I move the adoption of this portion of our report.

Dr. O. T. BENSON: I second the motion.

The motion prevails.

Dr. A. R. SORENSON: In reviewing the reports of the Councillors of the activities of the various districts, it was noted that several District Societies had held comparatively few meetings during the year. In order that there might be developed a more closely knit organization, a better knowledge of current medical and economic problems, and to stimulate membership in the district organization, this Committee would recommend to the Councillor of each District that he foster a movement whereby there may be a joint meeting of neighboring districts to be held once or twice yearly. Such a meeting would be sponsored by the district with the largest membership and a worthwhile program be provided. It is felt by this Committee that this would promote the scientific welfare of the organization as a whole. I move the adoption of this portion of our report.

Dr. O. T. BENSON: I second the motion.

The motion prevailed.

Dr. A. R. SORENSON: This Committee has reviewed the report of the Delegate to the American Medical Association with a great deal of interest. It brings out forcibly the problems that face us as a whole and the efforts that are being made to solve our economic problems. This Committee believes that this report is so well worth studying that it would recommend that a copy be made available to each member of the State Association, either by publishing in the official paper, or that a copy be sent to the Secretary of each District who shall read it at a meeting of his district society.

Speaker: May the Chair ask, Doctor, has your Committee any preference as to the way in which you wish this taken care of? You mentioned two ways.

Dr. A. R. SORENSON: I believe it would be better to send a copy to each Secretary and have him read it at some district meeting.

Dr. O. T. BENSON: I second the motion.

The motion prevailed.

Dr. A. R. SORENSON: I move the adoption of this Reference Committee Report as a whole.

Dr. W. W. WOOD: I second the motion.

The motion prevailed.

Report of the Committee on Resolutions

Dr. A. R. SORENSON, Chairman: Mr. Speaker, I would like also to present the report of the Committee on Resolutions: Be it resolved, that the House of Delegates of the North Dakota State Medical Association hereby extend the thanks of the Association to the Members of the Grand Forks District Medical Society and to the members of the Arrangement Committee for the splendid Scientific Program they have provided, and for their generous hospitality.

I move the adoption of this report.

Respectfully submitted,
A. R. SORENSON, M.D., Chairman.
W. A. WRIGHT, M.D.
P. H. WOUTAT, M.D.

Dr. SYVER VINJE: I second the motion.
The motion carried.

Report of the Reference Committee to Consider the Reports of Standing and Special Committees

Dr. W. A. WRIGHT, Chairman: Mr. Speaker, I would like to move that the following recommendation by the Reference Committee to consider the Reports of the Standing and Special Committees be adopted. The report of the Committee on Medical Preparedness was read and we recommend its adoption. This Committee recommends that the Committee continue to use their efforts in not depriving communities of indispensable physicians.

Dr. C. J. MEREDITH: I second the motion.
The motion prevailed.

Election of Officers

Speaker: Now, we return to the Election of Officers. Dr. Burton, Chairman of the Nominating Committee, may we hear your report?

Dr. PAUL H. BURTON presented the following nominations:
President: Dr. Fred Fergusson, Kulm.
Speaker of House of Delegates: Dr. John H. Moore, Grand Forks.
President-Elect: Dr. A. R. Sorenson, Minot.
First Vice-President: Dr. Frank Darrow, Fargo.
Second Vice-President: Dr. A. O. Arneson, McVile.
Secretary: Dr. L. W. Larson, Bismarck.
Treasurer: Dr. W. W. Wood, Jamestown.
Delegate to the American Medical Association: Dr. A. P. Nachtwey, Dickinson.
Alternate Delegate to the American Medical Association: Dr. Frank Darrow, Fargo.
Councillors:
First District: Dr. Paul H. Burton, Fargo.
Third District: Dr. G. M. Williamson, Grand Forks.
Sixth District: Dr. N. O. Ramstad, Bismarck.

The Speaker appointed Drs. Wright, Meredith and Wood as Tellers. Nominations were requested from the floor, but none were made.

All elections were by ballot to conform with the Constitution and By-Laws and all those nominated by the Nominating Committee were declared elected by the Speaker.

Dr. PAUL H. BURTON, Chairman: We have nominated for the State Board of Medical Examiners, four men this year. These men are, Dr. C. W. Schoregge, Bismarck; Dr. W. C. Fawcett, Starkweather; Dr. C. J. Glaspel, Grafton; Dr. Paul Rowe, Minot.

Speaker: Are there any further nominations from the floor that you wish to present for the Governor to consider for the Board of Medical Examiners? Hearing none, we will proceed with the balloting. These can be voted on all at once.

Teller MEREDITH: There were 16 votes cast for Dr. Schoregge; 16 for Dr. Fawcett; 16 for Dr. Rowe and 16 for Dr. Glaspel.

Speaker: I declare Drs. Schoregge, Fawcett, Glaspel and Rowe the Nominees for the Board of Medical Examiners and you have adopted the report of the Nominating Committee by your balloting.

Selection of Meeting Place for the 1942 Annual Session

Invitations from the Stutsman County Medical Society and the Jamestown Chamber of Commerce were read by the Secretary. An invitation from the Conventions Committee of the Bismarck Association of Commerce was read by the Secretary. Jamestown was unanimously selected as the meeting place for the 1942 Annual Session.

New Business

Dr. W. C. FAWCETT, Starkweather: May I raise the point of the voting by ballot, Chapter V, Section 1 of the By-Laws, which reads as follows: "All elections shall be by ballot and a majority of the votes cast shall be necessary to elect." I was Chairman of the Committee on Constitution and By-Laws, and

that is the way it read in the old Constitution. We only copied it in that way, figuring you would go on just as you have before you ruled that you would live up to that. What can we do so that we would not have to go individually voting through all the nominations?

Speaker: You can introduce a Resolution at the First Session of the House of Delegates to amend this.

Is there any new business?

Dr. A. P. NACHTWEY: I would just like to make a few remarks about the time of the meeting next year. I wish to state these remarks, purely for the idea that the Delegate's Report given at the Medical Meetings have been just one year late. I think there are so many things that occur at the American Medical Association which should be brought to the attention of the House of Delegates of the North Dakota State Medical Association. If it is possible, and does not inconvenience anyone, I think we should hold our Annual Meeting sometime soon after the American Medical Association meeting.

Speaker JOHN MOORE: I think your suggestion is very timely. The Constitution provides that in between meetings, the Council shall have full authority and power of the House of Delegates.

Dr. W. W. WOOD: When are the American Medical Association meetings held?

Dr. FISHBEIN: Seldom after the first week in June; never after the second week in June. Next year it is in Atlantic City. It is practically impossible to meet anywhere except in about five cities as the Association has grown so large. However, if you counted on the first week in June, you would be right most of the time.

Speaker: Your speaker is privileged at this time to officially welcome again, a distinguished guest to the House of Delegates. I am going to ask Dr. Glaspel to escort Dr. Fishbein to the platform. We would like to have a few words from him.

Dr. FISHBEIN gave a short address on current medical events.

Speaker: Thank you, Dr. Fishbein, it is very kind of you to talk to us. If there is nothing further to come before the House of Delegates, Gentlemen, we will stand adjourned.

There being no further business, the House of Delegates was adjourned at 6:00 P. M., May 19, 1941.

SCIENTIFIC PROGRAM

Tuesday, May 20, 1941

- 7:30—Committee Breakfasts.
- 8:30—Registration at Convention Hall.
- 9:00—View Exhibits.
- 9:45—Paper: "Vitamins"—Dr. E. H. Rynearson, Rochester, Minn.
- 10:15—Paper: "Common Symptoms of the Normal Nose"—Dr. K. M. Simonton, Rochester, Minn.
- 10:30—Symposium on Heart Disease:
"Valvular Heart Disease"—Dr. Paul Rowe, Minot, N. D.
"Cardiac Arrhythmias"—Dr. W. H. Long, Fargo.
"Coronary Disease"—Dr. J. O. Arnsen, Bismarck.
"Pathology of Heart Disease"—Professor E. T. Bell, University of Minnesota.
- 12:15—Round Table Luncheons, Subjects:
"Renal Disease and Hypertension"—Prof. E. T. Bell.
"Diabetes"—Dr. E. H. Rynearson, Rochester, Minn.
- 1:30—Moving Picture—"Traumatic Surgery of Extremities."
- 2:15—President's Address—Dr. C. J. Glaspel, Grafton, N. D.
- 2:30—Symposium on Traumatic Injuries:
"Knee"—Dr. E. Parnall, Minot.
"Wrist"—Dr. H. J. Fortin, Fargo.
"Ankle"—Dr. J. C. Swanson, Fargo.
- 3:30—Paper: "What the North Dakota Compensation Bureau Expects of the Physicians"—Dr. W. H. Bodensstab, Bismarck.

Wednesday, May 21, 1941

- 9:00—Moving Picture: "Vaginal Repair—Cystocele and Rectocele."
- 9:30—Paper: "Therapeutic Procedures in Chronic Rheumatoid Disease"—Dr. MacNider Weatherby, University of Minnesota.

- 10:00—Brief Ceremony, Honoring the Physicians who have practiced in the State Fifty Years, or more. G. M. Williamson, M.D., conducted this ceremony.
- 11:00—Paper: "Cancer of the Large Bowel"—Dr. W. A. Fansler, Minneapolis, Minn.
- 11:30—Paper: "Diseases of the Skin"—Dr. H. E. Michelson, University of Minnesota.
- 12:00 to 2:15—Round Table Luncheons, Subjects:
 "Office Treatment of Ano-rectal Disease"—Dr. W. A. Fansler, Minneapolis, Minn.
 "Chemo-Therapy"—Dr. M. Weatherby, University of Minnesota.
 "Common Skin Lesions of Office Practice"—Dr. H. E. Michelson, University of Minnesota.
- 2:15—Paper: "The Physician and Selective Service Program"—Major R. A. Bier, M. C., Washington, D. C.
- 3:00—Dr. C. J. Glaspel introduced the newly elected President of the Association, Dr. F. W. Fergusson, Kulm, N. D.
- 3:30—Paper: "Sex Hormones"—Dr. J. L. Conrad, Jamestown.
- 4:00—Paper, "Management of the Breech"—Dr. W. A. Coventry, Duluth.
- Open Forum on Obstetrical Problems—Conducted by Dr. Coventry, Duluth, Minn.

**NORTH DAKOTA
STATE MEDICAL ASSOCIATION
OPEN MEETING**

Monday, May 19, 1941—7:45 P. M.

High School Auditorium, Grand Forks

Music furnished by the Grand Forks High School Music Department.

Address of Welcome by Dr. Muus, President of Grand Forks Society.

Response by Dr. C. J. Glaspel, President of the North Dakota State Medical Association.

Address: "Medicine in a Changing World"—Dr. Morris Fishbein, Editor of the *Journal of the American Medical Association*.

Part of this address was broadcast over a state-wide network of radio stations from 8:30 to 9:00 P. M. The following stations donated their facilities: Radio Stations KFYZ, Bismarck; KFJM, Grand Forks; KRMC, Jamestown; KGCU, Mandan; KVOX, Moorhead, Minn.; KOVC, Valley City.

**CEREMONY, HONORING VETERAN PHYSICIANS
May 21, 1941—10:00 A. M.**

Dr. C. J. GLASPEL: We will have a brief ceremony to honor the doctors who have practiced in the State fifty years or more. Dr. G. M. Williamson will conduct this Ceremony.

Dr. G. M. WILLIAMSON: Mr. President, and Members of the Association, I have the honor of presenting the men who have been in active practice in North Dakota for upwards of fifty years. We have in all, eleven in the State. I will read the names of all, and the years in which they were licensed. There are just four who could be with us today for this Ceremony:

Dr. Charles B. Harris, Pembina; Licensed July 6, 1885; Annual Registration Number 100; License Number 41.

Dr. James Grassick, Grand Forks; Licensed September 29, 1885; Annual Registration Number 101; License Number 240.

Dr. F. N. Burrows, Bathgate; Licensed August 7, 1886; Annual Registration Number 102; License Number 427.

Dr. J. V. Quick, Wahpeton; Licensed May 2, 1887; Annual Registration Number 103; License Number 503.

Dr. Andrew Carr, Minot; Licensed May 9, 1888; Annual Registration Number 104; License No. 629. I would like to introduce Dr. Carr, who is with us today for this ceremony.

Dr. James P. Aylen, Fargo; Licensed May 31, 1888; Annual Registration Number 105; License Number 630. This is Dr. J. P. Aylen, who is with us today for this Ceremony.

Dr. G. W. Glaspel, Grafton; Licensed September 17, 1888; Annual Registration Number 106; License Number 639. May I introduce Dr. Glaspel, the father of our distinguished President.

Dr. T. C. Patterson, Lisbon; Licensed May 15, 1889; Annual Registration Number 107; License Number 655.

Dr. Chas. MacLachlan, New Rockford; Licensed June 17, 1889; Annual Registration Number 108; License Number 660.

Dr. A. T. Horsman, Devils Lake; Licensed May 10, 1890; Annual Registration Number 109; License Number 705.

Dr. W. H. Welch, Larimore; Licensed May 20, 1890; Annual Registration Number 110; License Number 714. May I introduce Dr. W. F. Welch, who is with us today on this platform.

If any of you fellows behave yourselves as well as those men, you might be honored as they have been some day. These men are all Honorary Members of the State Association, and are a shining example of what good men were born years ago.

Dr. C. J. GLASPEL: I was over to the hospital and contacted Dr. James Grassick. He wished me to convey his most cordial greetings to the Convention. He handed me a piece of paper and asked to have the Secretary read this to you, as a response from the Honorary Members.

Dr. L. W. LARSON: I would like to read to you first, a letter from Dr. F. N. Burrows, Bathgate, in response to our invitation to appear on the Program this morning. This is as follows:

"Dear Doctor Larson: I have received the invitation to attend the 1941 Session of the Association and take part in the honors to be conferred on the Half Century Club.

Will you please assure the officers and members of my appreciation of the honors and of the good will involved.

I went to Grand Forks to attend a meeting but as I was the only attendant from outside of Grand Forks, the late Dr. Wheeler entertained me. That was in 1887.

At present I am suffering from a sharp attack of herpes zoster and too weak to remain on my feet more than 15 minutes at a time.

I regret the fact that I shall not be able to meet my associates, especially those who belong in the 50 year class.

I hope the present meeting is steering the professional ship wisely through the very troubled seas of change. Much is at stake.

Again thanking the members and officers,
 (Signed) F. N. BURROWS."

The following is the response from Dr. Grassick:
 President, Officers and Fellows:

I wish to tender a word of appreciation and thanks for this gracious expression of courteous good will; not for myself alone but for the others, present or absent, of the veterans of fifty or more years of service in our Association.

Looking forward, fifty years seem an eternity—backward, but a day!

Fifty years on the front with thirty years more or less in preparation, carry us well beyond the three score and ten milestone; and the question, "How does it feel?" is frequently heard. Speaking for myself, the reaction is something like this:

Nature at first glance may seem stern, relentless and even cruel, demanding the last pound of flesh; but on closer inspection she is found to be gentle, kind and indulgent, intent on the happiness and well being of her creatures as seen in the world about us, or in our personal experiences. She blends the lush, budding freshness of Spring, the fragrance of green and growing things of Summer, and a touch of the glory and majesty of Winter, and gives us Autumn, rich, mellow, and colorful, with Indian Summer reminiscent of everything in life that is purest, sweetest, best—thrown in for good measure!

Every normal life has its autumn. At its best, a period of quiet restfulness, where the fading foliage of Summer is interspersed with splotches of crimson and gold and where the smoky haze of Indian Summer, seemingly from the smoldering embers of countless campfires, absorbs the glare and mellows all.

But the sweet memory-posies, "Roses in December," if you will, that we prize so highly, must have springtime plantings and summer waterings for richest fragrance.

With such a varied and interesting background and with a firm grip on the essentials of "something to do, something to love, and something to hope for," in the words of R. L. S. "We should all be as happy as kings."

Let us stop here. To say more might lead to unseemly platitudes. To say less, would be to dishonor the occasion.

In conclusion: While there is strength in our arms, we hand you the Torch. Grasp it firmly and hold it high! And in the words of Tiny Tim: "God bless us every one."

J. GRASSICK, an '85-er.

INSTALLATION OF PRESIDENT

F. W. FERGUSSON, M.D.

May 21, 1941—2:00 P. M.

Dr. C. J. GLASPEL: I wish to introduce the newly-elected President, and to conduct him into office as it is the custom I will select Dr. H. E. French of the University of North Dakota, and Dr. John H. Moore to escort Dr. Fergusson to the platform.

Dr. H. E. FRENCH: Dr. Glaspel, I am pleased to present our newly-elected President, Dr. Fergusson.

Dr. C. J. Glaspel: It hardly seems necessary for me to present Dr. Fergusson to this Association, as you all know he has been a very active worker. He has been present at all of our meetings; a Councillor from the Eighth District for many years, and in addition he has served on one of the most important Committees we have. Some of you may not know that he comes from a family who is professionally inclined. He has a brother who is a dentist and another brother who is a doctor at Edgeley, N. D. He was born and raised in Walsh County. How he came to move away and get down in the Jamestown territory, I know not, but it might be a good thing, as we have so many good doctors in this County, it is hard to keep the wolf from the door.

In turning over the details to you, Dr. Fergusson, I know you are going to have the coöperation and support of all the members of this Association, the Councillors, Chairmen of all Committees and all Officers. The Speaker of the House, Dr. Moore, and the Secretary, Dr. L. W. Larson, are, as you will find, practically indispensable. In presenting to you this symbolic gavel, I do so with my very best wishes for a most constructive year.

Dr. F. W. Fergusson: Officers, Councillors, Members of the North Dakota State Medical Association,

I appreciate very much the honor conferred upon me in my election as President of this Association. As I enter upon the discharge of my duties, I am mindful of my limitations and I shall rely largely upon your counsel and friendly suggestions.

I accept this opportunity to extend my congratulations to our cut-going President and express my appreciation for his accomplishments.

We are engaged in worthwhile achievements. Our Society has definite purposes and ideals. If we stand together we can accomplish much. Divided by differences, we are all surely to fall heir to practices and policies that would modify the expression of the doctor of tomorrow. He is one of our responsibilities. We should not fail him.

We all have ample reason to be profoundly thankful for the immense strides made in the art of healing during the past half century. In no department of human endeavor have greater advances been made, and assuredly the triumphs achieved, although they may not excite the plaudits of the crowd as do some of the more spectacular attainments, are nevertheless of the greatest benefit through sanitation, prevention and recovery from the dread blight of disease.

There are many physicians, good and true, who should be in the ranks of organized medicine, helping by word and action to defend the just cause of organized medicine against the encroachment of those insidious forces constantly active, and which are gaining momentum. Nefarious political control of our profession will eventually yoke every medical man and woman to the slavery of socialistic, communal or state medicine. He will become a doctor assigned to care for the surgical and medical needs of a fixed number of the citizenry of a state at a nominal retainer with no regard for individual worth or efficiency, merely a medical automaton.

United one hundred per cent for their common cause, doctors can demand and secure their just rights. If you work in a profession, work for it; if you live by a profession, live for it.

Again I thank you for the position to which you have elevated me and I assure you of my desire to justify the confidence you have placed in me.

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We will now continue with the Scientific Program.

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Dr. F. W. FERGUSSON: We will now conclude the Scientific Program for this year. It has been an enjoyable and profitable time here in Grand Forks. We will all be looking forward to seeing you in Jamestown next year.

Presidential Address*

C. J. Glaspel, M.D.

Grafton, North Dakota

WE ARE living in historic days. It seems almost certain that those who record events in the future will decide that the past year has been one of the most crucial for civilization. The Four Horsemen ride and ride hard on three continents and on as many seas. Antagonistic philosophies of life are engaged in a bitter struggle against each other. In Europe we have seen numerous small countries lose their identity and succumb to powerful nations and in this country, the Federal and State Governments are capitulating to the demands of organized labor. Such worldwide sweeping changes in the social order are certain to affect the medical profession either directly or indirectly, and it would require a prophet indeed, to anticipate what is to be the future of medicine.

At each annual meeting of your association it is the official duty of your president to report to you on the state of your association together with whatever recommendations have been formulated relative to our important policies. It is my purpose to do this in as brief a manner as possible.

Military Service

During the World War more than thirty-two thousand physicians voluntarily served with the armed forces. In the haste of preparing an adequate medical corps at that time, there is no question but what mistakes were made and in some areas the civilian population suffered from the lack of physicians. In order to avoid making these same mistakes again the House of Delegates of the American Medical Association appointed a Committee on Medical Preparedness at its annual meeting in New York City in June, 1940. This Committee went to work at once and secured detailed information of the qualification and the availability of the 145,000 physicians in the United States who are in active practice. Nearly all of these men responded to the questionnaire sent out and from the card index thus obtained, the Government knows the qualifications and specializations of every physician. In this way, they can be employed in military service in positions for which their civilian training best prepares them.

Each state was then organized to prepare for the selective service men. Physicians were named for Draft Boards, Advisory Boards, and Appeal Boards and these Boards have now been at work for several months. We can be justly proud of the 18,000 volunteer medical men who are contributing the time and effort necessary in examining draftees. They have worked without publicity, without compensation, and without thought of calling a strike in some critical hour. Theirs is a grave responsibility, as by eliminatng those physically and mentally unfit for military service, they are saving future taxpayers untold millions spent later for hospitalization

*Presented before the North Dakota State Medical Association, May 20, 1941.

at Government expense, compensation allowances, and pensions. Mental and nervous cases from the World War have since cost the Government \$32,000 per case. Many of these who were diagnosed shell-shock were mental cases before they ever enlisted. Tuberculosis has cost the Government \$20,000 per case since the World War. Many of these had early tuberculosis when they enlisted. These medical Draft Boards must do their work well, accept or reject draftees only if they are positive, and in cases of doubt, refer them to Advisory Boards. Bear in mind that if a man is a detriment to his home community, he will continue to be a detriment to either the Army or the Navy.

Colonel Rowntree has reported that 32 per cent of the registrants under Selective Service have been rejected as being physically unfit for general military service, 20 per cent of these men were unfit for any form of military service while the remaining 12 per cent were suitable for limited military duty. Of the men passed as physically fit by the local medical examiners 12 per cent have been disqualified at the Induction Stations by the Army Medical Corps Examiners.

This would appear to indicate a lack of coöperation between those in charge of Induction Boards and the local Boards and the present rate of rejection by the Induction Boards is so high it reflects unkindly on the local Medical Examiners. This may possibly be explained by the fact that Induction Boards operate in groups where special examinations such as the eyes and ears are made by specialists in that line who are usually more exacting.

In addition, the men chosen for induction should not only be free from physical defects and ailments but also present no mental or personality deficiencies. The physical demands and the mental stresses of military service are not easy and therefore, the medical examination at the induction centers is purposely more stringent than at the local Draft Boards.

The ten major causes for rejection were as follows in their order of frequency, namely: Defects in teeth; cardiovascular system; musculo-skeletal defects; eyes; genital, including venereal; mental and nervous; ears, nose, and throat; hernia; feet; and lungs. The causes for rejection in North Dakota closely followed this outline.

Leaders in medical education have finally persuaded the Selective Service Administration that medical students should be exempt from the draft and be permitted to finish their medical education. While approximately fifty-one hundred men graduate from medical school each year, nevertheless, all are not physically qualified for military service. In addition, they must replace the thirty-eight hundred physicians who die annually.

By July 1st of this year, it is estimated there will be one million four hundred thousand men in the armed forces of the United States and this Army will require approximately nine thousand physicians to take care of their medical needs. These physicians will be obtained if possible from the fifteen thousand members of the reserve corps. Records show that North Dakota has contributed twenty-eight physicians to the military forces of the nation and these men are now serving with either the National Guard or as reserve officers on active duty. The Surgeon General of the 7th Corps Area has recently written me that he has been well pleased with the voluntary response from North Dakota and that this state has contributed her fair share of medical men. Many of the men who have volunteered for service have done so at great financial sacrifice. Modern warfare, however, requires the mobilization of every resource of the Nation and sacrifices must be made by every one. An apt question presents itself, namely, what is to become of the practice of the physician called to military duty? If the experiences of the World War are to be repeated, many of these men will return only to find their practice dissipated and their patients gone to other physicians, many of them never to return. This is a most unfortunate tragedy, yet one which no government regulation can correct. The answer to it must be found in the good will, the charity, and the humanity of the medical men remaining at home and who acquire these new patients. To these men I say, "Serve these new patients well, but it is your patriotic duty to return them to their own physicians when they again come back to civilian practice." In order to rectify these conditions the five counties comprising greater New York have set up a special plan which operates as follows: When a physician enters Military Service he notifies his county medical society. His patients are then cared for by other physicians but the resulting fees go into a special fund less a five per cent charge for overhead, this fund being eventually turned over to the physician or his family. While this plan is not ideal and will find no response in North Dakota, nevertheless, it at least demonstrates that some thought is being directed towards this important problem.

Socialized Medicine

On January 7, 1941, Senator Wagner of New York told the press that he and others were again sponsoring a National Health Bill, and he further stated that it would likely be worked out in connection with the defense program. This program would, in brief, include the construction of new hospitals, payment of compensation for disability wage losses, and the expansion of maternal, infant, and child health and welfare services plus general public health service and general medical care. The above statement coming from so authentic a source as the Senior Senator from New York should make the medical profession realize that the plan for altering the practice of medicine is still ready in Washington for the attention of Congress when the time to call a vote is considered appropriate, and there is no doubt it can be rushed through in rapid fashion when the proper opportunity arrives. It is possible that this

bill may even be introduced at this session of Congress by some other Senator than Wagner but really under his management and approval.

The job of coordinating all health, medical welfare, nutrition, recreation and other related fields of activity in defense has been handed over to the Federal Security Administrator, Paul V. McNutt. He will have jurisdiction over the medical aspects of the draft, rehabilitation of the rejectees, over civilian and military medical supplies, sanitation and health in Defense Zones and mobilized areas and research essential to National Defense. A careful study of this shows that Mr. McNutt has been given complete and broad powers to control the practice of medicine as it applies to defense and from here it could easily be further extended.

The American Medical Association has recently been convicted in a District of Columbia Court of being a Trust. No individual member of the Association was found guilty and in other words there was conspiracy but no conspirators. The exact reason of the serious effort made by the Government to convict the American Medical Association is still not entirely plain but it seems difficult to believe that the events in Washington with the group Hospital plan of the Home Owners Loan Corporation are the real cause of the legal action. Some think this is part of the plan to socialize the practice of medicine and by this means a fine opportunity is presented to get much publicity for the alleged need of a change.

This case was appealed to a higher court to decide if the practice of medicine is a trade or a profession. The result of this trial has been the occasion for considerable editorial comment in the lay press, and while most of the papers were sympathetic to the American Medical Association, some suggested that a more tolerant view towards the formation of Group Health Associations and in experiments in medical economics. Comments by the *Chicago Tribune* were especially interesting:

They stated in part that "since the American Medical Association has been declared a trust, it should have a good A.F.L. or C.I.O. Charter as a means of solving some of their economic problems. Then Draft Boards would not be asking physicians to give free service in examining draftees, all chest thumping in charity wards would be done at the union scale and any non-union medico who tried to cut in on the business would have to pay a \$1,000 initiation fee; women expecting offspring would have to be careful labor pains did not start up after 4 P. M. on Friday as they would be charged double time for a weekend delivery." (April 7, 1941). While this is perhaps intended as satire, it does contain suggestions which might be useful to the profession from an economic viewpoint.

I have been interested in reading recently, articles in women's magazines, apparently written by non-medical men advocating that the Federal Government should give all mothers prenatal medical care. It states in part that "we worry over the wheat and cotton crop, commodity prices, etc., but the babies, our most important national asset, are neglected and left to shift for them-

selves. Every mother is entitled to a chance for her life, health and happiness and every baby is entitled to be born right. A mother serves the Nation as loyally and as unselfishly as a soldier who goes into battle. She too, is in National Service and is entitled to protection and care in return. So far we are more interested in building reform schools, institutions, and courts to care for the delinquent, ailing and defectives. We seem to have our social services wrong end forward too often."

Whether the above statement is true or not, may be argumentative, but when hospitalization and medical care is offered to every expectant mother without charge, you have a proposition which is certain to be favorably received. My personal opinion is that while the method of medical practice cannot surely be changed suddenly and by one blow, nevertheless, some form of at least state directed medicine is to be gradually formulated whether we, as a group, like it or not.

Membership

The officers of your association are most concerned over the fact that so many practicing physicians in the state are not members of the association. Our paid-up membership to date this year is approximately 350, whereas, there are 476 physicians registered in the state. This means that there are approximately 125 practicing physicians in the state who do not belong to the association and, that our society really represents a little less than 80 per cent of the eligible memberships. These are not percentages which we can be especially proud of, and I feel as though the officers of this association are partially responsible for this in not making the association sufficiently attractive so as to interest every man practicing in the state. Medical science is continually on the advance and for any physician to lose stride with his associates, means antiquation.

I know of no better method for a medical man to acquaint himself with modern methods than to attend district and state meetings, visit and exchange ideas with his medical colleagues as to new and better ways to alleviate human suffering. If we could make all practitioners realize this, our attendance and membership would be substantially improved.

It, of course, must be born in mind that there are some physicians who cannot become members because for one reason or another they are refused admission to the District Society. However, this is the case in only a small percentage of the 150 men who are outside of our ranks.

There are, however, twenty-eight members of our association in the military service at this time whose annual dues are now or likely will be passed for the duration of their service.

Last year at Minot a distinguished physician of the state told me that he hoped I would have the time and the energy to visit every component society once during the year. He stated that many men who are regular attendants at our district meetings are seldom able to attend the state meetings, and therefore, have no direct contact with their state association. A visit by any of the State Officers during the year would tend to create

more interest and demonstrate that the association has something constructive to offer. At that time I considered that a most excellent suggestion and I consider it a most excellent suggestion today. It was my intention to follow this recommendation, but unfortunately, I did not.

Our State Secretary, however, Dr. Larson, visited seven of the component societies, namely: Fargo, Bismarck, Minot, Oakes, New Rockford, Devils Lake and Valley City, and I know that he brought them a message from the state organization in a more capable manner than I could have done. It is my belief that your newly elected president should feel that it is one of his official duties to visit and inspect each component society during the fiscal year. The responsibility for obtaining an increased membership should be very definitely fixed on either the officers of the association or the councillors. There should be no division of this responsibility.

Sickness and Hospital Insurance

This is an important problem and of significant importance to every member of the medical profession in the state. Sickness insurance is far from simple. It is complicated in its administration and in its legislation and so far has no actuarial basis. While the theory of sickness insurance is certainly desirable, especially for low income, its practice is not so easy to carry out. There are multiple and varied plans in operation, none of which are perfect.

Much study must precede our acceptance and endorsement of any plan. It will be one of the functions of our Committee on Economics to continue their study of the various plans under trial in the various states with the hope of eventually developing one which will be most acceptable to all concerned.

Committee on Medical Benevolence

It is a statistical fact that most persons in the United States reach the age of retirement without having been able to lay aside sufficient finances to care for them in their old age. Generally speaking, physicians are notoriously poor business men and are, therefore, no exception to this rule. Many state medical associations in the United States have created a Benevolence Fund, the purpose of which is to provide the necessities of life for those physicians or their widows who are needy and have reached the age where they are unable to work. This fund is developed through the allocation of one dollar per year from the dues of each member, plus other funds obtained from gratuities or endowments. It is a plan which has been in operation in Pennsylvania for the past 37 years, and has recently been reported favorable in Illinois and in several other states. It would be my recommendation to your new President that he appoint a Committee on Medical Benevolence who will investigate the feasibility of creating a benevolent fund in this association for indigent physicians and their widows.

Graduates from Foreign Schools

According to the statistics furnished by the Bureau of Immigration of the United States the influx of graduates of Foreign Medical Schools into the United States has increased from 329 in 1931 to a total of 1384

for 1939, with a total of 4549 for the ten year period. While most of these men seem content to remain in the Urban centers of the East, nevertheless, this situation if it continues may eventually present a menace and a problem causing great concern to the medical profession of this state. I feel certain that your State Board of Medical Examiners are fully acquainted with this situation and must at all times protect the native practitioner so that he is not discriminated against in favor of foreign graduates.

On behalf of our State Association, I wish to compliment the members of the Grand Forks District Society for the very fine accommodations, for the entertainment and for the excellent scientific program that they have arranged for us. It is always a pleasure for us to meet in Grand Forks.

I also wish to thank the officers, the councillors, the chairman and the members of each individual committee

of the various committees have existed in more than name only and have carried out a most constructive program. We, of the Association, are grateful for their work. I feel especially indebted to Dr. Larson, our Secretary, for the service that he has rendered. It has been far beyond what ordinary duty would call for. Dr. N. O. Ramstad, as President of the Council, and Dr. John H. Moore, as Speaker of the House, have been of assistance to me in numerous ways.

In addressing this association in Minot last year, I expressed apprehension that I could not present all the high qualities of leadership which you have been accustomed to see in this office. During the past year, this apprehension became a distinct reality. I do want you to know, however, that I have appreciated the privilege and the honor of serving you to the best of my ability.

NORTH DAKOTA STATE MEDICAL ASSOCIATION DISTRICT SOCIETY ROSTER -- 1941

CASS COUNTY MEDICAL SOCIETY

PRESIDENT	
Dr. E. H. Richter	Hunter
SECRETARY-TREASURER	
Dr. E. M. Haugrud	Fargo
*Aylen, J. P.	Fargo
Baillie, W. F.	Fargo
Boerth, E. H.	Buffalo
Borland, V. G.	Fargo
Burton, Paul	Fargo
Bond, John H.	Fargo
Clay, A. J.	Fargo
Clark, Ira D. Jr.	Casselton
Darrow, Frank	Fargo
Darrow, K. E.	Fargo
Dillard, J. R.	Fargo
Elofson, C. E.	Fargo
Evans, L. J.	New York City
Fjelde, J. H.	Fargo
Fortin, H. J.	Fargo
Fortney, A. C.	Fargo
Foster, G. C.	Fargo

Hanna, J. F.	Fargo
Haugen, H.	Fargo
Haugrud, E. M.	Fargo
Haynes, G. H.	Lisbon
Hendrickson, G.	Enderlin
Hunter, G. W.	Fargo
Huntley, H. B.	Kindred
Ivers, G. U.	Fargo
James, J. B.	Page
Joistad, A. H.	Fargo
Kaess, A. J.	Fargo
Lancaster, W. E. G.	Fargo
Larson, G. A.	Fargo
Lewis, T. H.	Fargo
Limburg, A. M.	Fargo
Long, W. H.	Fargo
McGregor, M.	Fargo
Mazur, B. A.	Fargo
Miller, H. W.	Casselton
Morris, A. C.	Fargo
Nichols, A. A.	Fargo
Nichols, W. C.	Fargo
Oftedal, A.	Fargo

Oftedal, T.	Fargo
Ostfield, J. R.	Fargo
Pray, R. E.	Fargo
*Patterson, T. C.	Lisbon
Peterson, Donald	Fargo
Richter, E. H.	Hunter
Rostel, H.	Fargo
Rothnem, T. P.	Fargo
Sand, O.	Fargo
Schatz, George	West Fargo
Sedlak, O. A.	Fargo
Sinner, B. L.	Fargo
Skarshaug, H. J.	Washburn
Kelsey, A. W.	Fargo
Stafne, W. A.	Fargo
Stolinsky, A.	Lisbon
Swanson, J. C.	Fargo
Tainter, R.	Fargo
Tronnes, N.	Fargo
Urenn, B. M.	Fargo
Watson, E. M.	Fargo
Weible, R. E.	Fargo
Winn, W. R.	Fargo

DEVILS LAKE DISTRICT MEDICAL SOCIETY

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Arneson, O. A.	McVille
Call, A. M.	Rugby
Drew, G. F.	Devils Lake
Engesather, J. A. D.	Brocket
Fawcett, W. C.	Starkweather
Fawcett, D. W.	Devils Lake

Fawcett, J. C.	Devils Lake
Fawcett, N. W.	Devils Lake
Ford, F. W.	Devils Lake
Graham, J. D.	Devils Lake
Greengard, M.	Rolla
*Horsman, A. T.	Devils Lake
Hughes, B.	Rolla
Keller, E. T.	Rugby
Kohlmeyer, F. C.	Lakota
Laugeson, L. L.	San Diego, Calif.
McDonald, J. A.	Cando

McIntosh, G. J.	Devils Lake
McKeague, D. H.	Maddock
Mattson, R. H.	McVille
Olafson, K.	Cando
Reed, Paul	Rolla
Smith, C.	Devils Lake
Sihler, W. F.	Devils Lake
Serhus, L. N.	Rolette
Stickelberger, J.	Oberon
Toomey, G. W.	Devils Lake
Vigeland, J. G.	Brinsmade

GRAND FORKS DISTRICT MEDICAL SOCIETY

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SECRETARY	
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TREASURER	
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Benson, T. Q.	Grand Forks
Benwell, H. D.	Grand Forks
*Burrows, F. N.	Bathgate
Countryman, G. L.	Grafton
Cavaney, J. P.	Langdon
Campbell, R. D.	Grand Forks
Dailey, W. C.	Grand Forks
Flaten, A. N.	Edinburg
French, H. E.	Grand Forks
Glaspel, C. J.	Grafton
*Glaspel, G. W.	Grafton
Goehl, R. O.	Grand Forks
*Grassick, James	Grand Forks
Griffin, V. M.	Grand Forks

Grinnell, E. L.	Grand Forks
Haagensen, E. C.	Grand Forks
Hardy, N. A.	Minto
*Harris, C. B.	Pembina
Haugen, C. O.	Larimore
Hetherington, J. E.	Grand Forks
Hofto, J. M.	Grand Forks
Irvine, V. S.	Park River
Jenson, A. F.	Grand Forks
Johnson, C. A.	Larimore
LaMont, J. G.	Grafton
Landry, L. H.	Walhalla
Law, H. W. F.	Grand Forks
Leigh, R. E.	Grand Forks
Leibeler, W. A.	Grand Forks
Lodmell, L. A.	Grand Forks
Lohrbauer, L. T.	Grand Forks
Lommen, Clarence E.	Fordville
Mahowald, R. E.	Grand Forks
Moore, J. H.	Grand Forks
Mulligan, V. A.	Langdon
Muus, O. H.	Grand Forks
Panek, A. F.	Milton
Peake, Margaret V.	Grand Forks
Quale, V. S.	Grand Forks

Rand, C. C.	Grafton
Ransom, H. R.	Grand Forks
Robertson, F. O.	East Grand Forks, Minn.
Ruud, H. O.	Grand Forks
Ruud, M. B.	Grand Forks
Rystad, O. H.	Grand Forks
Silverman, Louis	Grand Forks
Stratte, J. J.	Grand Forks
St. Clair, Robert	Northwood
Thorgrimson, G. G.	Grand Forks
Tompkins, C. R.	Grafton
Vance, R. W.	Grand Forks
Vollmer, Frederick J.	Grand Forks
Wagar, Wm. D.	Michigan
Waldren, H. M. Jr.	Drayton
Waldren, H. M. Sr.	Drayton
Weed, F. E.	Park River
*Welch, Wm. F.	Larimore
Williamson, G. M.	Grand Forks
Witherstine, W. H.	Grand Forks
Woutat, P. H.	Grand Forks
Wold, H. R.	Grafton
Youngs, N. A.	Grand Forks

KOTANA MEDICAL SOCIETY

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AbPlanalp, I. S.	Williston

Craven, J. D.	Williston
Craven, J. P.	Williston
Dochterman, L. B.	Williston
Hoepfer, P. G. E.	New York City
Johnson, P. O. C.	Watford City
Johnson, Maxwell	Watford City

Jones, C. S.	Williston
Korwin, J. J.	Williston
Skovholt, H. T.	Williston
Weeks, S. A.	Ambrose
Wright, W. A.	Williston

NORTHWEST DISTRICT MEDICAL SOCIETY

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Brunner, Harmon	Minot
Cameron, A. L.	Minot
Carr, Andy M.	Minot
*Carr, A. M.	Minot
Devine, J. L. Jr.	Minot
Downing, W. M.	Minot
Durnin, W. G.	Bottineau
Dyson, R. E.	Minot
Fischer, V. J.	Towner
Flath, M. G.	Stanley

Garrison, M. W.	Minot
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Grangaard, H. O.	Ryder
Greene, E. E.	Westhope
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Halverson, H. L.	Minot
Hanson, G. C.	Minot
Haraldson, Olaf	Minot
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Kermott, Henry	Minot
Kermott, L. H.	Minot
Kelsey, C. M.	Minot
Knudson, K. O.	Glenburn
Lampert, M. T.	Minot
Lemieux, D.	Rolla
Little, Ethel E.	Minot
McCannel, A. D.	Minot

Malvey, Kenneth	Bottineau
Moreland, J. W.	Carpio
Nelson, Woodrow	Minot
Northrop, Cedric	San Haven
O'Neill, R. T.	Minot
Parnall, Edward	Minot
Pence, R. W.	Minot
Ransom, E. M.	Minor
Rollefson, C. I.	Crosby
Rollie, C. O.	Drake
Rowe, Paul H.	Minot
Seiffert, G. S.	Minot
Sorenson, A. R.	Minot
*Timm, J. F.	Makoti
Wall, W. W.	Minot
Wheelon, F. E.	Minot
Woodhull, Robt. B.	Minot
Yeomans, T. N.	Minot

RICHLAND COUNTY MEDICAL SOCIETY

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Beithon, E. J.	Hankinson

Bateman, C. V.	Wahpeton
Durkee, C. A.	Abercrombie
Hoskins, J. H.	Wahpeton
Kellogg, I. W.	Fairmount
Miller, H. H.	Wahpeton
O'Brien, L. T.	Wahpeton

Olson, C. T.	Wyndmere
*Quick, L. V.	Wahpeton
Reiswig, A. H.	Wahpeton
Sasse, E. G.	Lidgerwood
Thompson, A. M.	Wahpeton

SHEYENNE VALLEY MEDICAL SOCIETY

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Brown, Fred	Valley City
Campbell, Wm.	Valley City
Cook, Paul T.	Valley City
Dodd, Robert K.	Wimbleton
Dodds, G. Alfred	Valley City
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Some Diseases of the Lower Part of the Genital Tract*

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A KNOWLEDGE of the development and functions of the female genitalia and a conception of the functions of the glands of internal secretion are requisite for an understanding of diseases of the female genital tract.

Some of the more frequent infectious conditions encountered in the genital tract seem to be associated with certain deviations from the normal physiologic processes of the vaginal tube. In such diseases as trichomoniasis, moniliasis, gonorrhoea and senile vulvovaginitis there are variations from the normal which possibly indicate a similar susceptibility on the part of the tissues of the host to these four infectious diseases.

Since *Trichomonas* vaginitis has in recent years become the most common infection of the genital tract seen by the gynecologist caring for an average class of patients, this condition will be considered more in detail. An attempt will be made to demonstrate factors of similar significance in the etiologic background of such conditions.

In considering the function and structure of the external genitalia it is recalled that the uterus, cervix and vagina to just within the hymen are formed by a fusion of the lower portion of the müllerian ducts. Most of the anomalies of these organs are the result of incomplete fusion of these ducts or persistence of the septum formed by the fusion. The external genitalia result from invagination and infolding of the sinus urogenitalis; the orifice occupies a position between the other chief excretory orifices, the urethra and the anus. Lining membranes of the female organs are epithelial throughout but vary in structure in different portions. In the uterus and cervix the mucosa is secretory and the product of secretion is mostly an alkaline mucus; the lining at the introitus is also secretory and it secretes both mucous and sebaceous fluids. The lining of the vagina consists of squamous or pavement epithelium and is folded into rugae. Normally there are no secretory vaginal glands but it is assumed that there is a fluid transudate from the network of lymph and blood vessels surrounding the vagina. The vaginal moisture that occurs in cases in which the uterus and cervix have been removed is possible evidence of this. The mucous membrane in the vagina seems also to have an absorptive function. This is demonstrated by the systemic response to vaginally applied estrogenic substances after the operation of total hysterectomy. Externally the hair and the labia shield the introitus and the sphincteric action of the levator muscles holds the orifice closed. Secretions of the labial glands bathe the surface membranes. Within the cervix there is a continuous outpouring of slightly alkaline mucinous material which plugs the uterine cervix and fills

the spaces between the palmate folds. As this alkaline secretion empties into the vaginal vault it mixes with the acidified fluid of the vagina and is liquefied. Thus a mild chemical change occurs in the upper part of the vagina. The pH of vaginal fluids shows an increase in acidity as the samples are collected farther away from the cervix. Acidity of vaginal fluid is maintained by the action of acidifying organisms of the vaginal flora on the glycogen of the epithelial cells desquamated from the walls of the tract and it is supposed by some that the rhythmic cycle of secretion of hormones from the endocrine glands assists in maintaining the glycogenic content of these cells. The hormones involved in this process are considered to be estrogen and progesterone and possibly, also, factors from the pituitary body and the adrenal cortex.

Menstrual blood, the deposit of semen and introduction of certain medicaments tend to alter the vaginal acidity. Menstrual blood is alkaline and flushes the cervix and vagina periodically and seemingly thereby would disrupt the natural protection of the mechanism. Most pathogenic organisms of the vaginal tract are at least inhibited by an environment which is acid, and thrive only when the acidity of the fluid is reduced or when the fluid has an alkaline reaction. Infections occur when the resistance of the host is reduced, when the physiologic function is disrupted and when the virulence of the invading organism overcomes the resistance of the tissue.

ETIOLOGIC CONSIDERATION

Organisms that are associated with inflammation of the vagina can be grouped roughly into two types: (1) those which are invaders of tissue and subsist on the living tissue of the host and (2) those which infest the cavity and obtain nutriment from substances contained therein or from the waste products. Streptococci, staphylococci, and others of the coccoid group are the invasive type of organisms. *Trichomonas*, *Streptothrix* and the yeast-like fungus of *Monilia albicans* are the infestive type of organisms.

Either or both of these types or groups of organisms may be found without gross evidence of inflammation and patients may be considered as carriers just as there are carriers of other diseases of mankind. Reports of routine investigations of vaginal contents of all patients reveal as many carriers of *Trichomonas* without any appearance of inflammation as there are cases in which the flagellate is associated with vaginitis; streptococci have been cultured on routine examination in 10 per cent and staphylococci in 60 per cent of cases. Whether or not gonococci invade stratified epithelium is uncertain. Gonococci usually are associated with other organisms of an invasive type and when so found seem to have a predilection for the invasion of the glandular epithelium of

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the introitus and the uterine cervix; sometimes they are accompanied by the *Trichomonas*.

Whether the infestive type of organism alone is responsible for inflammatory processes has been the subject of considerable controversy among investigators. In many authoritative reports it is stated positively that the *Trichomonas* has the ability to produce morbid changes in tissue; from other reports it appears certain that the *Trichomonas* acts only in symbiosis with other recognized pathogenic organisms.

The question of the pathogenicity of *Trichomonas* has not been settled as yet, but, whether the organism is pathogenic or not, the tendency is to consider the rather characteristic vaginitis associated with the organism as trichomoniasis.

The source from which the trichomonads infesting human beings are derived is still undetermined. It seems reasonable to assume that the trichomonad probably is transmitted by some means from one human being to others. Consideration of the high incidence of infestation in venereal clinics, which in one report was listed as 66 per cent, and the frequent association of gonorrhoea, favors the supposition that infestation with *Trichomonas* may be classed as a venereal type of contagion. It must be remembered, however, that the patients of such a clinic have disease of the generative tract which has lowered the resistance of the host and that the average incidence of infestation in the general run of patients is probably roughly around 20 per cent. Even this latter group of women are not entirely well for they have sought medical services. There are also many instances in which sexual relations do not seem to have been a possible means of contamination. There are, however, instances in which the male has been shown to harbor the organism.

The mutation theory assumes that a patient may transmit trichomonads from the mouth or the intestines to the vagina, and that the organism undergoes certain morphologic changes in order that it may be adapted to its environment. Speculation on transmutation is interesting. There are three types of trichomonads infesting human beings: those found in the vagina, called *Trichomonas vaginalis*; those that are found in the mouth, the *Trichomonas buccalis*, and those that occur in the stool, the *Trichomonas intestinalis*. Contamination of the vagina with organisms from the mouth or intestines would seem acceptable as a source of *Trichomonas vaginalis* were it not that authoritative investigators have asserted that the three types of *Trichomonas* always maintain their identifying differences when cultured under exhaustive variations of media and conditions which would favor transmutation.

Animal experimentation and the transplantation of the various types into the vaginas of human beings have not given convincing results. Furthermore, the incidence of infestation by *Trichomonas intestinalis* or *buccalis* among human beings is not at all equal to that by *Trichomonas vaginalis*. In 23.5 per cent of Peterson's series of cases *Trichomonas vaginalis* was present; in 16.5 per cent, *Trichomonas buccalis*, and in 1.5 per cent, *Trichomonas*

intestinalis. Liston and Liston referred to the results obtained by Kofoed and Swezey from 25,000 examinations of the stool of 8,000 persons. They found *Trichomonas intestinalis* in 1.1 per cent. Neither *Trichomonas buccalis* nor *Trichomonas intestinalis* is often associated with demonstrable lesions of the mouth or the intestines. Efforts to demonstrate the coexistence of either *Trichomonas buccalis* or *Trichomonas intestinalis* with *Trichomonas vaginalis* were so seldom rewarded with positive results that the procedure has largely been abandoned at The Mayo Clinic.

The trichomonads are protozoa, and protozoa are found practically universally in all types of organic matter. Protozoa are known to occur in encysted or spore forms, but trichomonads are not believed to develop that resting stage. Many species of animals seem to harbor an apparent parasitic, nonpathogenic trichomonad which has species identification for that animal.

Cattle are often seriously infested with the bovine type of *Trichomonas*, and serious epidemics in herds occur with many instances of abortion and pyometra in which the fluid is swarming with bovine type of *Trichomonas*. Hees expressed the belief that the increased incidence of trichomoniasis among human beings since the World War is definitely related to epidemic infestations of cattle and that the infestation is transmitted by food, flies and other contact.

From the foregoing résumé it is clear that the source of *Trichomonas* infestation is an unsolved question.

It seems probable that some nutritional variant of individuals in certain geographical locations may be a reason why the disease is more prevalent in some localities than in others. At least the vaginal infestation of the organism seems dependent on alterations of the environment of the vaginal tube from the normal status. Whether this alteration is of systemic origin or a local change in the vagina is uncertain, but some experimental observations indicate that the variation from normal in the vagina is dependent on nutritional and perhaps hormonal variations of the host.

The fluids in the vagina are normally slightly acid and have a pH of approximately 4.5. In these fluids certain bacillary types of organisms are found, of which the *Bacillus döderleini* is perhaps the most significant. These bacillary types of organisms comprise the normal vaginal flora. The squamous epithelium is normally several cells thick and contains an adequate amount of glycogen. As this epithelium is shed it is acted on presumably by these normal bacilli and the glycogen is converted into lactic acid which in turn serves to neutralize the alkaline secretions from the uterus and cervix and maintain vaginal acidity. When vaginal inflammation appears, the pH of the vaginal fluid has shifted toward neutrality or to the alkaline side, the normal vaginal flora has disappeared and the invasive coccoid type of organisms associated with leukocytes and other evidences of the ravages of the inflammatory process predominates. When *Trichomonas vaginalis* is encountered, the pH of the vaginal fluid is usually around 6 and the associated bacteria are of the coccoid variety. When the pH is 7 or higher, the

Trichomonas seems less frequent but the coccoid type of bacteria is more abundant. *Neisseria gonorrhoeae* is frequently associated with the stronger alkalinity.

Certain structural changes of the pelvis which result in thinning of the vaginal mucosa tend to deprive the acidifying vaginal flora of glycogenic pabulum. Among such structural changes may be mentioned chronic pelvic inflammatory processes which inhibit the free flow of blood and lymph to the vaginal wall, pelvic tumors of various types, increased amount and duration of menstrual flow and abnormal uterocervical secretion associated with altered endometrium and disease of the cervix which result in increased cervical secretion. Such external causes as too frequent douches, excessive intercourse with deposits of semen and the use of contraceptive chemicals also may be mentioned.

Deposition of glycogen in tissues of the body seems related to the ebb and flow of estrogen and progesterone and possibly to certain pituitary factors. It has been shown that a factor of the adrenal cortex influences the conversion of body proteins into glycogen and its deposit in the liver but the deposition of glycogen in the epithelium of the vagina is thought by some to be more dependent on the influence of the female sex hormones. Vitamin A also seems to have some bearing on the epithelial metabolism as is demonstrated in cases of *achylia gastrica* and food deficiencies with epithelial atrophy.

Thus it is seen that both local and systemic factors seem to be combined in the production of vaginitis and much of the therapeutic endeavor has been directed toward an attempt to restore abnormalities of the local tissue by combined local and systemic treatment.

Age and social status do not seem to have any relation to the occurrence of *Trichomonas*. It has been observed in a three months old baby, in children, in women who are undoubted virgins and in women well past the menopause. The average age of the patients in Peterson's large group was 26.3 years. A number of investigators have examined all their women patients for *Trichomonas* as a routine procedure with interesting variations in results. Peterson found that 24.6 per cent of 5,712 patients were infested with *Trichomonas* but concluded that only 15 per cent of these had symptoms of vaginitis while an additional 21 per cent had obscure but possible symptoms. About 4 per cent revealed vaginitis and the flagellate. Liston and Liston surveyed American literature and found the reported incidence of infestation with *Trichomonas* to vary from 13 to 37.5 per cent; in their series of 200 women patients from a venereal clinic the incidence was 43.5 per cent; about half the patients had associated gonorrhea. Lissimore and Currie on examination of 105 patients in a venereal clinic found that the incidence of *Trichomonas* was 66.9 per cent.

Study of vaginal trichomoniasis leads one to speculate about the apparently increased incidence since the period of the World War. May not the variations of the social, political, and economic status of women have a bearing on the frequency of a state of so-called nervous exhaustion, and this in turn effect an imbalance in the

cyclic rhythm of the sex hormones of her body? May not the use of various chemicals applied as vaginal antiseptics and contraceptive devices have reduced the protective mechanism of the vaginal tube? Perhaps the use of factory-made menstrual pads rather than the ones prepared from home-laundried material may have impaired the efficiency of the external barrier at the vulva.

Another thought is that perhaps the trichomonad is an invasive type of organism which may enter the blood stream and other organs, or that it may occur in an encysted form, and that the healing of vaginitis is only a surface manifestation while, as suggested by Robertson in studies of gastric mucosa, subsurface evidences of inflammation may persist after apparent or surface healing has occurred.

VAGINITIS

Trichomonas vaginalis vaginitis. Trichomoniasis seems to have been more prevalent since the social disruption of the period after the Great War. The uncertainty of the methods of dissemination of the disease, as well as that of the theories of remedial therapy, reminds one of similar periods of uncertainty related to other diseases such as amebiasis.

The question of whether trichomoniasis is a venereal disease as mentioned previously is unsettled. Although Donné isolated the *Trichomonas* of leukorrhea in 1836, it was only after the World War that particular attention was attracted to the condition. Magath has demonstrated that results of examination of fresh smears are as accurate as those of culture methods.

The flagellated protozoan is approximately the size of a leukocyte but its size varies in different cases and at different times in the same case. Observations of the very large and active trichomonads have been made in cases in which the body temperature has been elevated considerably, as for instance after fever therapy. Powell has described multiplication by binary fission.

Trichomonads have been found in certain glands, and Goodall, Anderson and MacPhail have reported the involvement of the uterine and tubal cavities. Such instances may account for some of the cases of treatment resistance or reinfestation, but they are an exception and are encountered only rarely.

Treatment. Most of the chemical antiseptic substances have been used in various forms of application as remedies for trichomoniasis: many physicians have adopted some favored remedy which they commonly use. Formerly, most substances used for treatment were in solution. Later they were administered locally as a powder associated with some dehydrating substance. More recently, the various so-called parasiticides have gained in favor, and these may be mixed with an acidifying agent and dehydrating substances. Combinations of arsenicals, quinine derivatives and iodine compounds are the basis of most of those in use at present, and manufacturers of pharmaceuticals have prepared them in convenient packages or as tablets.

Another principle of therapy is based on the need of the vaginal epithelium for carbohydrate, such as lactose,

to be utilized in supplying glycogenic pabulum for the normal vaginal bacteria. All of such remedies have much in their favor, and readily alleviate the symptoms of the majority of patients even if permanent cure is not produced.

A possible lack of estrogenic hormone in these cases must always be considered, and the administration of estrogen may be undertaken. Some remedies combine parasiticides, carbohydrate, pabulum and acidifying substances, and it is noteworthy that the remedial properties supposedly aimed at the parasite also destroy the associated invasive bacteria of inflammation just as readily as the trichomonad. A disruption of the symbiotic association tends to affect both parties of that relationship. There is a marked variation in the response of various patients; some are responsive to the simple acidifying douches of vinegar and water, whereas for others repeated trials with all methods of therapy seem unavailing.

The physician who treats a considerable number of patients with trichomoniasis gradually accumulates more and more of a group of the therapeutic resistant variety. A definite regimen of carrying out details and continuing an adopted program for a sufficient length of time is probably the most successful method to follow, irrespective of what particular remedy may be used. Associated conditions, such as a cervicitis, urethritis, menstrual abnormalities and general systemic infirmities, should be corrected by appropriate remedies. A patient with a stubborn trichomoniasis needs a physician whom she will consult at frequent intervals in the course of several menstrual cycles.

Monilia vaginitis. Vulvovaginal mycosis is a parasitic infestation of the vaginal tract by the yeast-like fungus of *Monilia albicans* or organisms closely resembling it. Investigation has shown that there is a large variation in the yeast-like organisms recovered from the vagina but all have some characteristics in common.

The vaginitis associated with infestation by *Monilia albicans* is frequently similar in appearance to that of *Trichomonas vaginalis* and smear or culture is often necessary before correct diagnosis can be made. Pruritus may be a more pronounced symptom than leukorrhea and the surface of the reddened tissue reveals a grayish film or caseous patches which result in petechial oozing when wiped off. The mycelia and conidia may be identified on the fresh smear but culture on dextrose agar slant with subsequent differentiation by transfer to a corn meal agar plate is a more reliable test. Discharge from the vagina has a sour or acetic odor and irritates the skin. Certain metabolic variations of the body are more often associated with mycotic infestations than with trichomoniasis. Many of these patients are either obese or may be cachectic from some debilitating disease. Mycosis is frequently encountered in cases of diabetes and when it occurs during pregnancy is difficult to cure until after delivery. This predilection may be the result of the abnormal carbohydrate metabolism of the diabetic and of the excessive quantity of glycogen in the vaginal tissue during pregnancy because of the prolonged and excessive estrogenic influence.

Treatment. A number of remedies are advocated for the treatment of mycotic vaginitis but a 1 per cent watery solution of gentian violet appears the most generally accepted.

Senile vaginitis. It appears reasonable to include senile vaginitis with the foregoing groups of vaginal infections and infestations as this condition is also based on a disorganization of the normal protective mechanism of the vaginal tract. Senile vaginitis usually occurs among patients who have passed the age of ovarian activity and an estrogenic deficiency seems to be responsible for the loss of normal resistance of the vaginal tract. The vaginal and vulval tissues have a withered appearance with marked thinning of epithelial layers and loss of submucous fat. Inflammation is accompanied by fibrosis and shrinkage of the canal with diminished lymph and blood flow. The leukorrhea is irritating and pruritus may be severe. Frequently punctate small ulcerations in the vaginal vault may be followed by synechia. The reason why only some and not all women should have this condition after the menopause is not clearly understood unless it is on the basis of degree of imbalance of hormones.

Treatment. Accepted therapy consists of the administration of varying amounts of estrogenic substances, preferably by means of vaginal suppositories, which should be supplemented by hypodermic or oral applications. Local soothing or mild antiseptics should be applied to the vulva. Some of the synthetic preparations of estrogen, such as stilboestrol, which is still in the experimental phase, seem to stimulate the reparative process. In certain nutritional deficiencies administration of vitamin A has given favorable results. An explanation of the reason why some of these patients do not respond to estrin and, in fact, have increased irritation from its use was offered by Shute, who stated that some patients maintain a body supply of estrogen in excess of their needs. He expressed the opinion that this is either derived from the anterior lobe of the pituitary body or the adrenal cortex. He directed the treatment against this oversupply of estrogen. He recommended in these cases administration of thyroid extract, gonadotropic substances or preferably, vitamin E as supplied in wheat germ oil.

GONORRHEA

Infections from *Neisseria gonorrhoeae* are in many respects similar to trichomoniasis and moniliasis but the invading gonococcus seems to have a predilection for the gland-bearing mucosa of the vulva and of the cervix whereas the vaginitis is due to the secondary invaders. When gonorrhoea is present the vaginal fluids are alkaline, the membrane appears to be a deeper red, and the secretion has more of the characteristics of pus. The gonococcus is an invading organism and is carried by body fluids and implanted in other parts of the body. Fortunately the gonococcus is one of the organisms susceptible to treatment with sulfamido compounds and

since the use of this chemotherapeutic agent has become prevalent, chronic gonorrhoea is more exceptional than formerly. Intensive and repeated therapy with the sulfamido drugs seems to control eventually most refractory infections and Randall and his co-workers have demonstrated the value of a combination of chemotherapy, fever therapy and pelvic diathermy.

COMMENT

From the foregoing consideration it would seem that the vulvovaginal irritations associated with or produced by *Trichomonas vaginalis*, *Monilia albicans*, *Neisseria gonorrhoeae* and those of senile vaginitis have many common phenomena and that they are largely based on a deficiency or breaking down of the natural protective mechanism of the vaginal tract. Furthermore, it appears that an imbalance of the body hormones or more particularly estrogen deficiency may be in some way partially responsible for this breakdown.

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Space Thinking and Time Thinking*

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Ann Arbor, Michigan

IT affords me great pleasure to participate in the program of the twenty-first anniversary meeting of the American Student Health Association and to welcome you to the University of Michigan. Today you have viewed with much interest and commendation the commodious and elegant new quarters of the Health Service of the University of Michigan. You may be assured that this edifice is not something that just happened. Behind it are forty years of push and pull on the part of dauntless souls consecrated to the concept that it is the obligation of a university to promote health along with education. In a large measure, this impressive building is a tribute to the energy, devotion and valor of a man who cast his lot with the Health Service back in 1912 when it began operation and who since 1917 has served as its praiseworthy director: Dr. Warren E. Forsythe.

We have met this evening to honor the founders of the American Student Health Association, the pioneer souls who blazed the path of the modern student health movement and who have now become the patriarchs of the association.

About 20 years ago, March 4, 1920, to be specific, a small group interested in the protection and promotion of the health of college and university students met for the first time in the Congress Hotel in Chicago to dis-

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cuss the programs and problems involved. According to the minutes of this first meeting it was called

"Upon the initiation of Dr. John Sundwall, director of the University of Minnesota Health Service to consider the need of an organization of persons interested in student health work. The meeting was attended by twenty representatives of American colleges and universities. Dr. Sundwall served as chairman of this meeting and Dr. W. E. Forsythe as secretary. Reports were received concerning the nature of the work then in progress at each institution represented."

The "pros" and "cons" relative to a national association of student health workers were presented. No action thereto was taken at this meeting but it was decided to call another meeting sometime later on in the year with a view of further deliberation. The second meeting was held in Chicago, December 31, 1920. The recorded attendance at this meeting was 37. A list of the attendants and institutions represented appears in the printed program of this meeting.

In the second assemblage the question of a national association of student health workers was again debated:

"Some discouraged the creation of an independent organization in health work and suggested attachment of our efforts to that of some existing national body such as the American Public Health Association. This was followed by considerable discussion for and against affiliation.

It was decided to proceed to determine the necessity and possible place for such an independent association.

The following excerpts taken from the proceedings of the December 31, 1920, minutes will acquaint you with some of the active participants:

"Dr. J. E. Raycroft of Princeton spoke of centralized authority over campus sanitation partly advisory and partly with power to act. He also suggested the Bellevue modification of the International List."

"Dr. Haven Emerson spoke of experience gained at Cornell in working out a plan of the Interdepartmental Social Hygiene Board."

"Dr. Joseph Ritenour of the Pennsylvania State College expressed his belief that a permanent organization should be formed to include all persons interested in student health work."

That the majority present were in favor of an independent national organization of college and university health workers may be gained from the following action:

"On motion of Dr. Reed, the temporary officers, Dr. John Sundwall, president, and Dr. W. E. Forsythe, secretary-treasurer, were made permanent for the coming year and the president was authorized to appoint three persons for the year to act with himself and the secretary in perfecting an organization and arranging for a program and other details for another meeting. Dr. Emerson supported Dr. Reed's motion which was unanimously carried."

In accordance with this action, the American Student Health Association was established and its first officers were:

President, Dr. John Sundwall, University of Minnesota; vice-president, Dr. Joseph E. Raycroft, Princeton University; secretary-treasurer, Dr. Warren E. Forsythe, University of Michigan; members of executive committee, Dr. Dudley B. Reed, University of Chicago, Dr. Thomas A. Storey, Stanford University.

You may be certain that we who were given the task to construct and launch the American Student Health Association approached it with some apprehension in view of the doubts voiced in the two organization meetings. "We walk by faith not by sight," said Paul. Assuredly, it was faith that provided us with the enthusiasm and determination to go about the task. Lincoln's counsel sustained us: "Let us have faith that right makes might; and in that faith let us to the end dare to do our duty as we understand it."

Twenty years of the march of time have now gone by since the American Student Health Association came into being. I believe you will all agree with me that faith has produced works and that faith has triumphed. The development and growth of the Association during this score of years have been rapid, substantial and satisfactory in every respect. May I not use the word "phenomenal?" Today, 190 institutions of higher learning

in the United States are members of the American Student Health Association. Each passing year has added to its momentum. The future will record accretions until practically all colleges and universities in our land will have become members of the American Student Health Association.

I cannot refrain from contrasting the spirit that pervaded the two organization meetings of twenty years ago with that of the spirit of this anniversary meeting. Then it was "Faith, the substance of things hoped for and the evidence of things not seen." Today it is a reality, achievement, assurance. At this point in our program this evening, we, the founders of the association, want to recognize and pay our tribute to the gallant men and women who have so intelligently and valorously served as the officers of the American Student Health Association. Assuredly, the torch which has passed on to each succession of helmsmen has been held high and the faith has never been broken.

There are two ways of looking at or sizing up an object or project whether it be a material thing such as our new student health building or a social institution such as a health service. Jacks in his praiseworthy volume, *Constructive Citizenship*, designates these two processes of thought as "space thinking" and "time thinking." In planning for and constructing a house or a building to serve as quarters for a business or a social institution, we become wholly absorbed in its location, size, number of rooms, conveniences and equipment. This is space thinking. When it comes to designing, establishing and operating a social institution, our consuming interests are in the personnel and machineries involved, seeing to it that these are given appropriate working quarters and that they are placed in the right relationship to each other with a view of effective performance. This is time thinking. The space thinker is contented with a design, photograph, picture of a material thing or a bird's eye view of a social institution in active operation. What do I see, now, at the present moment, suffices the space thinker.

Obviously, space thinking is a requisite in all planning, construction and operation. Assuredly, in the strenuous day's run of a health service with all its routine and exigencies, space thinking dominates and becomes a habit of thought. It is the easy and common way of looking at things and institutions. Perhaps this mechanistic age of ours constrains us to become almost exclusively space thinkers. Among the common accompaniments of space thinking and action with particular reference to social institutions, are fatigue, uncertainties, anxieties, discouragements, frustrations, and, too frequently, blunting of our faith in democracy.

One of the amenities of passing years is the tendency towards and the capacity to do time thinking. Time thinking is not content with a picture of the materials and affairs of the present moment. It involves yesterday, today and tomorrow. It asks and endeavors to answer: Whence came the health service? What is its meaning and worth? What is its duration and direction? What is next? Time thinking makes us realize

that we exist in space and live only in time. It is concerned with change. Space thinkers see an equestrian group in marble; the time thinker beholds the cavalcade.

The essential ingredients or stuff of time thinking are history—experience, which acquaints one with the past; philosophy—interpretation, which deals with the present; and prophesy, which attempts to chart the course or direction. These three blend into each other in the processes of time thinking. Someone has said, "An historian is a prophet or philosopher looking backward." Enheartenment, buoyancy, optimism, love for mankind and an enhanced faith in our democracy are among the invaring accompaniments of constructive time thinking.

The theme of the program this evening may well be designated as retrospective time thinking with reference to the American Student Health Association. Of the twenty who participated in the first organization meeting and the thirty-seven in the second, whom you honor this evening as the Founders of the American Student Health Association, only four of us are with you. The grim reaper has taken its toll of them. A variety of circumstances have precluded others from being with us. I now take great pleasure in presenting the four Founders—who are with you tonight: Dr. Warren E. Forsythe, Dr. Joseph E. Raycroft, Dr. J. P. Ritenour, Dr. John Sundwall. (*The Founders stood while the audience arose and applauded.*)

I want to assure you of our sincerest appreciation and thanks for the recognition and the honor you are bestowing upon the founders of the American Student Health Association.

You will note in the program that Patriarch Joseph E. Raycroft will review the history of student health work. Patriarch Thomas E. Storey was scheduled to tell us something about the early noteworthy activities of the Interdepartmental Social Hygiene Board and the Committee of Fifty in promoting student health work. We regret very much that Dr. Storey is unable to be with us. Dr. Dean F. Smiley, an early recruit of the association and who served as its eighth president, 1932-33, has graciously consented to substitute for Dr. Storey, notwithstanding he has had no opportunity to prepare for the occasion.

(The program of the Banquet Session of the twenty-first anniversary meeting of the American Student Health Association was continued as follows:

"History of Student Health Work," Dr. Joseph E. Raycroft, professor emeritus, Princeton University.

"Some Recollections of the Interests and Activities of the Interdepartmental Social Hygiene Board and the President's Committee of Fifty," Dr. Dean F. Smiley, medical advisor and professor of hygiene, Cornell University.)

After these addresses, Dr. Sundwall continued his remarks as follows:

I have already stated that among the invaring accompaniments of historical or retrospective time thinking is that of an enhanced faith in our democracy. The

remarks of both Dr. Raycroft and Dr. Smiley are attestations of this statement. In our country, a good idea is generally contagious. At first its spread may be slow, of an endemic character. In time it reaches pandemic proportions. Or to express it otherwise, sound principles take deep roots notwithstanding the surface growth, for a time, may be dwarfish and scrawny. In our democratic way of doing things, social welfare movements including public health and education have a hard time getting started. All sorts of barricades are placed in front of them. We must be mindful of the fact that hindrances, neglect, contentions and so on, in respect to new ideas and movements are important factors in the educational processes of our democracy. These obstinate accompaniments of any movement for the betterment of mankind give it sturdiness. Once established, however, its security and lastingness are assured. I have never known a politician-demagogue to maintain for any length of time a conspicuous position before the public who has tried to make capital by attacking state universities, public schools, public health and other sound institutions of society when once they have become accepted by our people. Speaking of student health services in particular, it has been my good fortune, for more than a quarter of a century, to be directly involved in student health work in three of our mid-western universities—Kansas, Minnesota, Michigan. In each of these institutions, the health service had a hard time getting started. Each was engendered in meekness; many were the obstacles placed in the path of progress. Today each is provided with serviceable and aesthetic quarters. I wanted to make this observation with a view of encouraging you in student health work who may feel neglected or daunted. My observation and experience constrain me to say: Do a good job of it and in time you will see erected on your own campus an edifice which will be a just recognition of and a tribute to your ideals and efforts. Democracy works that way. Thus does historic time thinking in respect to such sound social institutions as a health service sustain and augment one's faith in our democratic form of government notwithstanding its many imperfections.

It is a great privilege to have been engaged in pioneer work. Nothing can contribute more to a salubrious outlook on life than that of founding and building. We, the founders of the American Student Health Association, regard ourselves as unusually fortunate in having had the opportunity to have blazed the trail of student health work in our country.

I have already stated that history, philosophy, and prophecy, each running into one another, make up the stuff of constructive time thinking. Our president in her greetings to you today has said, "This twenty-first annual gathering of our association is our coming-of-age meeting." When an individual or institution comes of age, it should attempt to evolve a philosophy. Hereofore the "what"—sciences, and the "how"—art, technic, of student health work have been our consuming interests and we have made satisfactory progress with

them. The sciences and art of comprehensive student health work will always continue to be among our outstanding concerns. Now that we come of age, may I not suggest or propose that we include in the programs of our annual deliberations, discussions on the philosophy of student health work, its meaning and worth. Certainly the "why"—philosophy, and the "where to"—prophecy, of the modern student health movement should be given appropriate places on your programs.

Science is analytical. It is interested wholly in parts, in minutia. Philosophy is synthetical. It wants to put things together. It is concerned with the whole and the appropriate functional relationships of the parts which make up the whole. In my discourse this morning, I stressed the importance of the American Student Health Association becoming concerned, more and more, with its relationships to the other health operating agencies on the highway of life, namely; maternity and infant hygiene; school-child hygiene, industrial-adult and middle age hygiene, geriatrics-old age hygiene. There are other relationships as well. The student health service is in an integral part of the whole social movement for betterment. A health service whose interests and activities are circumscribed solely to direct health-medical services for students is not meeting its full obligations to society. It can and should contribute much to the

whole social movement including public health. In a former address, I have pointed out some of these relationships and the contributions that health services should make to social amelioration as a whole.¹

The philosopher is concerned with these relationships with their appropriate correlations and integrations into a functional unit or whole. He seeks to determine and interpret the meaning and worth of the parts and the whole. Voltaire said, "The discovery of what is true and the practice of what is good are the most important objects of philosophy." As a time thinker, the philosopher is concerned with continuity, duration, lastingness of a movement, and with its "where to" or direction. He attempts to chart its future course and thereby becomes the prophet.

In conclusion, let me say that the American Student Health Association, like all other professional associations and social institutions, is in need of a sound philosophy. Certainly the "why"—philosophy, and the "where to"—prophecy, should become concomitant interests along with the "what"—sciences, and the "how"—art, technic, in our thinking and in our discussions relative to student health work in general and the American Student Health Association in particular.

¹The Medical School and Student Health Service: Journal of the Association of American Medical Colleges, March, 1940.

Book Reviews

The Shiny Scoop, The String Bean Horse, by CAMILLA WING. Illustrated in full color and black and white by HARLEY I. DAVIDSON. Excelsior, Minnesota: Dannie Books. Price \$1.00 each.

The "feeding problem" has long been a source of concern to the general practitioner as well as to the pediatrician. Many are the theories that have been advanced, some by child behaviorists, psychologists, physicians and others in related fields. In the two books, *The Shiny Scoop* and *The String Bean Horse*, we get another solution to the problem by a writer who combines an understanding of children and principles of nutrition with a delightful, imaginative approach.

In these fanciful tales, a young boy by the name of Dannie has as playmates: Vitamin, Fat, Carbohydrate, Protein and Mineral! In a lively narrative style, the author presents these characters in an interesting series of adventures. The child learns, in a very pleasant way, why certain foods are good for him: because his little friends Vitamin, Fat, Protein, etc., live in them! The motivation comes from the child himself, rather than from parent or educator. The author's facts are scientifically correct; her style appeals to the child because she makes use of repetition and the appeal to familiar experiences.

The illustrations are delightful. They are in bright clear colors and full of action. The artist has excluded superfluous details which make the pictures appealing to even the very young child.

Dr. E. J. Huenekens, in his foreword to Miss Wing's book, says in part, "To the thousands of mothers who worry about their children's appetites and wonder what to do about it, this book should be very valuable. It is the answer." We add, to the thousands of physicians who see worried parents, *The Shiny Scoop* and *The String Bean Horse* may be the answer.

A Primer for Diabetic Patients, by RUSSELL M. WILDER, M.D., Chief of the Department of Medicine of the Mayo Foundation. Seventh edition, 184 pages. Philadelphia: W. B. Saunders Company: 1941.

Physicians will be interested in this popular handbook because it explains in detail how diabetic patients are being treated in 1941 at the Mayo Clinic. Dr. Wilder subscribes to the recent idea of maintaining patients on a sugar level sufficient to produce daily slight glycosuria. He uses protamine insulin and regular insulin in one syringe injected in the morning. The dose is decreased when the urine is consistently free of sugar until at least a trace appears in the morning urine. The book has gone through seven editions and has become an outstanding example of its type.

The 1940 Year Book of General Therapeutics, edited by OSCAR W. BETHEA, Ph.M., M.D., F.A.C.P., Professor of Clinical Medicine, Tulane University School of Medicine; Senior in Medicine, Southern Baptist Hospital; Senior Visiting Physician, Charity Hospital; member of the Revision Committee of the *U. S. Pharmacopeia*, 1930-1940; author of *Clinical Medicine and Materia Medica, Drug Administration and Prescription Writing*. 545 pages. Chicago: The Year Book Publishers, Inc., 304 South Dearborn Street: Copyright 1941. \$2.50.

The Year Book Publishers celebrate in this volume the fortieth anniversary of their annual book on General Therapeutics and the first number under the editorship of Oscar W. Bethea. Sulfonamides are well discussed in abstracts of many articles. The most expanded subject is that of vitamins with over fifty pages devoted to them. Most interesting are the editorial comments heading many of the sections. These "tone down" exaggerated claims and greatly assist the reader in estimating therapeutic value. More editorial comments would add to the value of the book.

The JOURNAL LANCET

Serves the *Medical Profession of*
MINNESOTA, NORTH DAKOTA SOUTH DAKOTA AND MONTANA

The Official Journal of the

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North Dakota Society of Obstetrics
and Gynecology

South Dakota State Medical Ass'n
Sioux Valley Medical Ass'n
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MINNEAPOLIS, MINN., AUGUST, 1941

MANY CALLED, MANY CHOSEN

The regular army Medical Corps, composed of career men in military medicine, unaided would be overwhelmed by the present army expansion. Civilian doctors called to serve with the Medical Corps must be prepared for every kind of duty with the medical service. Regular army medical officers number about a thousand. Over twenty thousand will be added during the expansion program. It is evident that most of the duties of the Corps will devolve upon the civilian doctors. In every arm and branch of the service, civilians of the reserve have been called to duty in such great numbers that at present most of the officers in the army are from the reserve. In the medical reserve were 15,000 doctors of whom to date about 10,000 have been called to active duty. At the rate they have been ordered out, the entire medical reserve will be exhausted by the end

of this year. The additional ten thousand or more doctors needed will be commissioned mainly from the ranks of the newly and recently graduated physicians.

The reserve officer of the line receives his professional military training after he goes on duty with the army. The doctor on the other hand comes in as a fully trained professional man. It is conceded at the outset that professionally he is qualified. His further training is aimed to fit him to carry out his function in wartime situations. He must be thoroughly grounded in field sanitation; he must know about medical supply and evacuation; he must know a great deal about medical administration.

The doctor is also an officer in the army. His position is one of leadership. He may, if he is assigned to a medical regiment, be in direct command of troops. In any assignment as an officer, responsibility will be thrust

upon him. American doctors have often demonstrated their ability to undertake vast responsibility. In the crisis of the present mobilization the physicians of the country have shown their willingness and ability to meet this emergency.

R. B.

THE "BUSINESS DEPARTMENT"

Some physicians seem to pride themselves on the fact that they are poor business men. They admit it freely on many occasions, the implication being that business judgment and professional ability are incompatible. Such, however, is not really the case. Some very excellent and effective medical publications are the recipients of first-class business thought and planning on the part of the officers and associations for which the publications are the official organs.

This is as it should be. No medical activity, with the possible exception of hospital operation, has more direct connection with the world of business than the medical journal; it brings medicine to business. Advertising activity needs no justification; it is a part of the province of a news magazine to carry advertisements. They are an aid to the practitioner, constituting, in effect, the

news bulletin of the pharmaceutical companies, appliance manufacturers, and service organizations that provide the tools of the profession—carrying advance notices of developments and plans.

Publications in general are largely supported and maintained by the revenue from advertisements. In the case of small professional publications this is difficult as the circulation total is not large, and circulation regulates rates, and rates measure advertising income. Devoted readership, however, offsets low circulation. Members usually go through their association journals from cover to cover. Much practical good comes to advertisers in exchange for what support they give by placing their announcements in medical journals. In return, each doctor has his part, however small, in fulfilling this contract, this exchange of respect and service.

Let us, therefore, be mindful of the implied agreement to reciprocate, to recognize and support those who favor us. We are engaged in the same great enterprise of maintaining and restoring health. It is a worthy enterprise, or we should not be in it. Our advertisers are worthy, likewise; or they would not have place in our columns.

A. E. H.

BOOK REVIEWS (Continued)

Medical Laboratory Technique, by J. M. FEDER, M.D., Director of Laboratories, Anderson County Hospital, Anderson, S. C. 241 pages. Charlotte, N. C.: Charlotte Medical Press: 1940.

Here is no ordinary laboratory manual. Feder has undertaken to explain how a small laboratory limited in space, facilities, and budget should function. He gives detailed directions for building or improvising many items of laboratory equipment: a sink out of a funnel and pail, a small ice box contained in a gallon thermos jug, a homemade colorimeter, a microtome using a Rolls razorblade, and many other ingenious physical improvisations. The directions for the laboratory procedures are concisely given and easily followed. Liberal, almost extravagant use of illustrations clarify complex procedures. The whole range of usual laboratory work is discussed. There are chapters on hematology, urinalysis, transfusions, sputum and stool examinations, bacteriology, spinal fluid examination, serology, elementary toxicology, histological technique, and others.

The volume cannot replace the standard texts on the subject nor is it intended for beginning laboratory students. A technician or doctor commissioned to devise a laboratory for a small hospital or office can use this book to its greatest advantage. However the many extremely practical suggestions for simplifying technique will be of interest to all laboratory workers. The book is highly recommended.

A Text Book of Ophthalmology, by SANFORD R. GIFFORD, M.A., M.D., F.A.C.S. Illustrated second edition, revised. Philadelphia and London: W. B. Saunders Company.

The second edition of Gifford's *Textbook of Ophthalmology* is a very concise and clear-cut work. It is highly recommended for all medical students and general practitioners. Ophthalmologists would do well to add this to their library as it reviews the latest ideas in ophthalmology. Fundus changes in hypertension, recent therapeutic agents, sulfanilamide, heparin, and the vitamins are discussed. The illustrations are excellent. Numerous colored plates are scattered throughout the book.

Orbital Tumors, Results Following the Transcranial Operative Attack, by WALTER E. DANDY, Adjunct Professor, Neurological Surgery, Johns Hopkins University. New York: Oskar Piest: 1941.

Dr. Dandy presents his operation for the removal of Orbital Tumors. He has a series of 24 cases that have been operated upon in this manner. The operation consists of an intracranial approach, removing the roof of the orbit after evacuating the cisterna chiasmatis and retraction of the frontal lobe of the brain. There is no question about the superiority of this approach in dealing with any tumor which may be both intracranial and intracranial.

The series of cases include a great variety of tumors, both malignant and benign and the results as shown by excellent photographs are quite satisfactory. The book brings out the necessity of the ophthalmologist cooperating with the neurosurgeon in dealing with extensive tumors in the orbit.

This book can be recommended as the best of its kind in the study of pathology and surgical treatment of the orbital tumor.

The 1940 Year Book of Neurology, Psychiatry and Endocrinology. Neurology edited by HANS H. REESE, M.D., Professor of Neurology and Psychiatry, University of Wisconsin Medical School; Psychiatry edited by NOLAN D. C. LEWIS, M.D., Director, New York State Psychiatric Institute and Hospital, Professor of Psychiatry, Columbia University; Endocrinology edited by ELMER L. SEVRINGHAUS, M.D., Professor of Medicine, University of Wisconsin Medical School. 856 pages. Chicago: The Year Book Publishers, Inc., 304 South Dearborn Street: Copyright 1941. \$3.00.

An innovation in this number is the special article by the editor of each of the three sections. Reese contributes a vignette of quasi-medical history on scalping, accidental and intentional. Nolan Lewis discusses "the pluralistic approach to psychiatric research" and Sevringhaus, female endocrine disorders. From the reader's viewpoint it would seem more profitable to devote the space to a general discussion of recent work in the field. The body of each section consists of articles from the literature abridged and edited in the characteristic Year Book style.

News Items

At the annual meeting of the Montana State Medical Association, held in Great Falls, June 23, 24 and 25, the following officers were elected: President-elect—Dr. E. D. Hitchcock, Great Falls; secretary-treasurer—Dr. Thos. F. Walker, Great Falls; councillors—District No. 5—Dr. A. D. Brewer, District No. 9—Dr. H. W. Gregg, District No. 11—Dr. S. A. Cooney, District No. 12—Dr. C. H. Fredrickson. Dr. W. E. Long was installed as president for the ensuing year.

Dr. Cedric Northrop has been reappointed for a two-year term as superintendent of the state tuberculosis sanatorium at San Haven, North Dakota.

Dr. Herald Cox of the United States Public Health Service Rocky Mountain laboratory, Hamilton, Montana, is the new president of the Montana Public Health association.

The North Dakota Radiological society which was formed last winter by correspondence, met in Minneapolis at the Center for Continuation Study on June 24, 1941. Dr. H. M. Berg of Bismarck was elected president.

Dr. H. A. Shaw, Minneapolis, has succeeded Dr. E. N. Nelson who recently left Lake Park, Minnesota.

Dr. Charles A. Arneson, Bismarck, North Dakota, who is with the U. S. Army Medical Corps at Lovell General Hospital, Ft. Devens, Massachusetts, has been promoted to the rank of captain.

Dr. R. R. Hendrickson, director of the Buena Vista Sanatorium at Wabasha, Minn., has been named new superintendent and medical director of the Sand Beach Sanatorium to succeed Dr. L. H. Flancher whose resignation became effective August 1.

Dr. R. Lawrence Casebeer, who spent the past year in Spokane specializing in eye, ear, nose and throat diseases, has become associated with his brother, Dr. H. L. Casebeer, in Butte, Montana.

Dr. William A. Black, Butte, Montana, completed his internship at St. James Hospital, Butte, and is now resident physician there. He will also conduct a private practice.

Dr. E. A. Doles, formerly of Havre, Montana, is now practicing in Clarion, Iowa.

Dr. Walter C. Jump, Kasson, Minnesota, is now with the Army Medical Corps at Fort Ord, California.

Dr. Charles Beck, who recently completed his internship at the Murray hospital in Butte, Montana, has begun his practice in Harvey, North Dakota. Dr. Kenneth W. Brown who also interned at Murray hospital, is practicing with his brother in Stratton, Nebraska.

Dr. Robert A. Murray, Aitkin, who recently joined the Army Medical Corps as Captain, has been promoted to the rank of Major. He is at Ft. Leonard Wood, Missouri.

Dr. William J. Cochrane, Lake City, Minnesota, 74, has retired from active practice after 45 years of service, 41 of which he spent in Lake City.

Three appointments to the North Dakota State Board of Medical Examiners were made by Governor John Moses last month. The appointees for three-year terms expiring June 30, 1944, are: Dr. C. J. Glaspel, Grafton; Dr. W. C. Fawcett, Starkweather; and Dr. C. W. Schoregge, Bismarck.

Dr. T. J. B. Shanley, Butte, Montana, recently completed the short postgraduate course given each year by the University of Washington.

The Fourth Annual Essay Contest of the Mississippi Valley Medical Society "for the best unpublished essay on a subject of practical and applicable value to the general practitioner of medicine" has been concluded. The Annual Awards Committee of the Society has announced that Robert B. Lewy, M.D., of Chicago, Illinois, Attending Staff, St. Joseph and Chicago Memorial Hospitals, is the winner, George A. Skinner, M.D., of Berkeley, California, second, and Arthur Bowen, M.D., of Los Angeles, California, third. The winner receives a \$100 cash prize, a gold medal, a certificate award, and an invitation to present his essay before the annual meeting of the Mississippi Valley Medical Society. Certificates of merit will be given to Drs. Skinner and Bowen. Dr. Lewy will address the society on the subject of his winning essay, "Comparative Studies in Pain Control," at Cedar Rapids, Iowa, October 2. His paper, and those of Drs. George A. Skinner and Arthur Bowen, will be published in the January, 1942, issue of the *Mississippi Valley Medical Journal*, the Society's official publication.

Necrology

Dr. Clarence L. Olson, 59, of McIntosh, South Dakota, died June 5, 1941, in Minneapolis. He had practiced in South Dakota since 1908, most of the time in the West River country. In addition to an arduous practice, Dr. Olson studied geology and early life of the West River area, collected fossils and early Indian artifacts, and was an expert gardener. He was known as McIntosh's "beloved country doctor."

Dr. L. G. Smith, 63, Mandan, North Dakota, was killed July 9, 1941, when his car struck a bridge abutment near Buffalo, South Dakota. He was enroute to a CCC camp at Custer, South Dakota, to assume his duties as camp physician.

Dr. Jesse A. Slocumb, 67, of Plainview, Minnesota, died July 3, 1941. He had retired from active practice three years ago on account of illness.

Dr. K. V. Overend, of Hallock, Minnesota, died recently after a lingering illness of several years.

Dr. Philip G. Cole, 59, former Helena, Montana, physician, died July 1 at his home in Tarrytown, New York. He was born in Helena.

REPORT OF THE
NINETEENTH ANNUAL CONVENTION
WOMAN'S AUXILIARY TO THE
AMERICAN MEDICAL ASSOCIATION

June 1 to June 6, 1941

Carter Hotel, Cleveland, Ohio

June 1 was not strictly the opening day of the Convention, as it was a day of pre-convention meetings, and a courtesy tea, an invitational affair extended to all members of the Executive and National Board members.

Monday morning, June 2, I attended the first Board meeting. The Auditor's report brought out the fact that the auxiliary is now 26,301 strong. However, a later report on membership increased this number to 27,179.

The budget for the coming year was outlined, and the fact became known that it would allow for the expense of a central permanent office for the Auxiliary, with a full-time paid Secretary.

Tuesday morning, June 3rd, marked the first open session in the large ballroom of the Carter Hotel. After invocation by the Rev. Dr. Walter H. Stark, and the address of Welcome and response the business meeting got under way.

Miss Etta A. Creech of Cleveland spoke on "What Is Sound Health." Miss Creech pointed out that *Hygeia* is by far the best health magazine in circulation.

Following Miss Creech's talk, the President's message was read by Mrs. Holcombe, a copy of which I brought home for each of our District presidents and state officers and chairman.

Reports from the various National Officers and Chairmen were then heard for the rest of the morning, ending with the presentation of Mrs. R. E. Mosiman, President-Elect.

Wednesday, June 4, was a day devoted entirely to business sessions, broken only by another luncheon held at the Carter. During the morning we heard Dr. Helen A. Hunscher speak on "Nutrition—Food for Fitness."

The reports from the State presidents were limited to two minutes. A new procedure introduced by Mrs. Christenberry served to speed up this formerly time-consuming part of the business session. She stated that a great deal of auxiliary work carried on by the various states is repetitious, so all presidents were given index cards on which to jot down the outstanding and most interesting activities of their state, to be read or quoted. She had the presidents of the various states march in carrying the flag of their state (D.A.R. flags borrowed from Washington), and mount a platform. After singing "America" each president in turn gave her report.

May I make a suggestion here. The *Bulletin* is indispensable to progressive Auxiliary work. You should all subscribe at once, requesting your first copy to be the midsummer number, which will give a great many interesting facts, as well as rosters of new officers and chairmen, not alone of the national auxiliary, but of the states as well.

LILLIAN S. NILSSON (Mrs. F. C.),
President of the Woman's Auxiliary to the
South Dakota State Medical Association.

Future Meetings

AMERICAN COLLEGE OF SURGEONS

The thirty-first annual Clinical Congress of the American College of Surgeons will be held in Boston November 3 to 7, with headquarters at the Statler and Copley-Plaza hotels. The twenty-fourth annual Hospital Standardization Conference sponsored by the College will be held concurrently. About five thousand surgeons and hospital executives from all parts of the western hemisphere are expected to gather in Boston for these meetings, the program for which will include clinics and demonstrations in local hospitals and medical schools, as well as scientific sessions, conferences, medical motion picture showings and exhibits in the headquarters hotels.

The Chairman of the Board of Regents of the American College of Surgeons is Dr. Irvin Abell of Louisville and the President is Dr. Evarts A. Graham of St. Louis. The President-Elect is Dr. W. Edward Gallie of Toronto, who will be inaugurated at the presidential meeting and convocation to be held the evening of November 3 in Symphony Hall, when several hundred initiates will be received into the fellowship of the College. In charge of local arrangements for the Clinical Congress is a committee of Boston surgeons headed by Dr. Leland S. McKittrick, Chairman, and Dr. Richard H. Sweet, Secretary.

Headquarters of the American College of Surgeons, which has a fellowship of more than 13,000 surgeons, are at 40 East Erie Street in Chicago. The associate directors are Dr. Bowman C. Crowell, who heads the Department of Clinical Research, and Dr. Malcolm T. MacEachern, Chairman of the Administrative Board and in charge of hospital activities.

INTERNATIONAL ASSEMBLY

Inter-State Postgraduate Medical Association of North America

This year, the International Assembly of the Inter-State Postgraduate Medical Association of North America will be held in the Municipal Auditorium, Minneapolis, Minnesota, October 13, 14, 15, 16, and 17. The high standing of the medical profession of Minneapolis, combined with the unusual clinical facilities of its great hospitals and excellent hotel accommodations, make this city an ideal place in which to hold the Assembly. The Hennepin County Medical Society will be host to the Assembly and has arranged an excellent list of committees who will function throughout the Assembly.

The officers of the Inter-State Postgraduate Medical Association, those of the Hennepin County Medical

Society and the Minnesota State Medical Association, extend a very cordial invitation to all members of the profession in good standing to attend. The members of the profession are urged to bring their ladies with them as a very excellent program is being arranged for their benefit by the Ladies' Committee.

A full program of scientific and clinical sessions will take place each day and evening of the Assembly, starting at 8:00 o'clock in the morning. In cooperation with the Hennepin County Medical Society, the Minnesota State Medical Association and the Minneapolis Civic and Commerce Association, a most excellent opportunity for an intensive week of postgraduate medical instruction is offered by in the neighborhood of eighty-five distinguished teachers and clinicians from different parts of the United States and Canada who are honoring the Assembly by contributing to the program. The speakers and subjects have been carefully selected by the program committee.

Pre-assembly and post-assembly clinics will be conducted, free of charge, in the Minneapolis hospitals on the Saturdays previous to and following the Assembly for visiting members of the profession.

Excellent scientific and commercial exhibits of great interest to the medical profession will be an important part of the Assembly. These exhibits will be open to members of the medical profession in good standing without paying the registration fee.

The registration fee for the scientific and clinical sessions will be \$5.00.

With a great deal of pride and satisfaction, we call your attention to the list of distinguished teachers and clinicians who are to take part on the program and whose names appear in the advertisement of the Assembly, elsewhere in the JOURNAL-LANCET.

DR. ROSCOE R. GRAHAM,
President,
Toronto, Canada.

DR. GEORGE W. CRILE,
Chairman, Program Committee,
Cleveland, Ohio.

DR. WILLIAM B. PECK,
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President, Hennepin County Medical Society,
Minneapolis, Minnesota.

DR. LEWIS M. DANIEL,
Secretary, Hennepin County Medical Society,
Minneapolis, Minnesota.

DR. CHARLES E. PROSHEK,
General Chairman, Minneapolis Committees,
Minneapolis, Minnesota.

Advertiser's Announcements

TRY PABLUM ON YOUR VACATION

Vacations are too often a vacation from protective foods. For optimum benefits a vacation should furnish optimum nutrition as well as relaxation, yet actually this is the time when many people go on a spree of refined carbohydrates. Pablum is a food that "goes good" on camping trips and at the same time supplies an abundance of calcium, phosphorus, iron and vitamins B₁ (thiamine) and G (riboflavin). It can be prepared in a minute, without cooking, as a breakfast dish or used as a flour to increase the mineral and vitamin values of staple recipes. Packed dry, Pablum is light to carry, requires no refrigeration. Here are some delicious, easy-to-fix Pablum dishes for vacation meals:

Pablum Breakfast Croquettes

Beat three eggs, season with salt, and add all the Pablum the eggs will hold (about 2 cupfuls). Form into flat cakes and fry in bacon fat or other fat until brown. Serve with syrup, honey or jelly.

Pablum Salmon Croquettes

Mix 1 cup salmon with 1 cup Pablum and combine with 3 beaten eggs. Season, shape into cakes, and fry until brown. Serve with ketchup.

Pablum Meat Patties

Mix 1 cup Pablum and 1½ cups meat (diced or ground ham, cooked beef or chicken), add 1 cup milk or water and a beaten egg. Season, form into patties, and fry in fat.

Pablum Marmalade Whip

Mix ⅔ cup Pablum, ¼ cup marmalade, and ¼ cup water. Fold in 4 egg whites beaten until stiff and add 3 tablespoons chopped nuts.

TRICHINOSIS

Until about ten years ago trichinosis was thought to be rare in the United States. During a recent survey in several cities on the Eastern Seaboard (Pub. Health Rep. 56:836, 1941) 3,000 diaphragms were examined postmortem and *Trichina spiralis* was found in 488 cases (16.3 per cent). There are probably several millions of infested persons in this country, among whom are possibly several hundred thousand who have had clinical trichinosis, never diagnosed as such, and there are possibly several thousands of deaths annually from this cause.

The greatest single clinical aid to the recognition of trichinosis is the intracutaneous skin test. The antigen used is a 1:10,000 dilution of a saline extract of *Trichinella spiralis* larvae free from the tissue of the animal host. The test is very simple to perform; a small quantity (0.1 cc. or less) of the antigen is injected intracutaneously into the skin of the forearm, and as a control a similar injection is made with the saline solution used for extracting the larvae. Positive reactions are characterized by development of an elevated wheal or edematous blanched area within twenty minutes. Since *Trichinella* Extract, Lilly, is unusually stable, it may be carried in the physician's bag as a useful aid in elucidating the etiology of unusual fevers and muscular pains in which diagnosis is uncertain.

SQUIBB MARKETS CALCIUM PANTOTHENATE

Pure synthetic calcium pantothenate, the calcium salt of pantothenic acid, one of the filtrate factors of the vitamin B complex, has been made available to physicians treating B complex deficiencies by E. R. Squibb & Sons, New York. It is supplied in two forms: in miniature capsules of 10 mg., packaged in bottles of 50, for oral use, and as an aqueous solution of 50 mg. per cc., in 5 cc. rubber diaphragm capped vials, for parenteral administration.

The use of pantothenic acid is still in the experimental stage and Squibb emphasizes that Calcium Pantothenate is to be used only by or on the prescription of a physician. Some workers have shown, however, that the pantothenic acid content of the blood of persons having severe deficiency diseases, such as pellagra, beriberi and riboflavin deficiency, is from 23 to 50 per cent lower than in normal persons and that with a rise in the pantothenic acid content there is a simultaneous increase in the riboflavin content of the blood.

Classified Advertisements

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Office and equipment of doctor, who, until his death recently, had practiced continuously and successfully for thirty years in the County. Established practice in county seat town, north-central section of South Dakota, that serves large territory. Community has urgent need of good physician at once. In this situation the Northwest District offers you an opportunity. Home is for sale also if desired to make part of deal. Address Box 712, care of this office.

RESIDENT PHYSICIAN WANTED

Long-established rest home, best of standing, excellent location, ethically managed, has place for resident physician or medical director who can become a part of institution and assist in building up clientele. Recent graduate who has majored in neuro-psychiatry and who can use quarters in the building or older practitioner living outside who has following and can make frequent visits, preferred. Address Box 713, care of this office.

EXCEPTIONAL OPPORTUNITY

for beginning or established physician to share suite of offices with another physician or dentist. Individual treatment room or laboratory, in new office building located in very best residential retail section. Address Box 714, care this office.

PRACTICE FOR SALE

For sale, practice in good live town, southeastern North Dakota, well equipped office, drugs, surgical instruments, library, and good introduction. Retiring. Office and residence optional. Address Box 715, care of this office.

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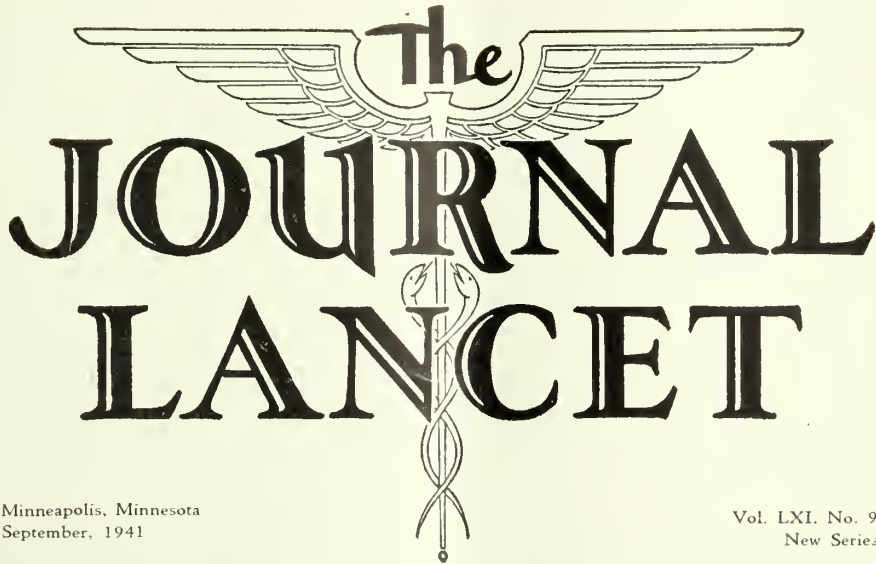
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Transactions of the Montana State Medical Association

Sixty-Third Annual Session
 Great Falls, Montana
 June 23, 24, 25, 1941

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**Minutes of the Sixty-Third Annual Meeting
of the Council of the Montana State
Medical Association**

The meeting was called to order by Dr. J. I. Wernham, President of the Montana State Medical Association, at 8:30 P. M., Sunday, June 22, 1941, in Great Falls, Montana. Dr. Wernham stated that a quorum being present, the first order of business was the election of a chairman by the Councillors.

Dr. S. A. Cooney, of the Eleventh Councillor District, was unanimously chosen chairman. Dr. Cooney called for the reading of the minutes of the last meeting. These were read by Dr. Walker and approved as read.

Dr. Cooney then called for the report of the Secretary. It is as follows:

At the last meeting, the Secretary called attention to the fact that for some period routine expenditures had been exceeding

net income with a consequent continued fall in the balance of funds on hand. For the first time a budget was adopted. The total of this budget was \$3,145. I take pleasure in stating that this budget was exceeded by but \$88.00. Due to the fact that \$450.00 were transferred from the bond account to the checking account to replace funds advanced to the Historical Committee, it is believed that we will have sufficient funds to care for ordinary expenses during the rest of the year. It is recommended that the same budget be adopted for the following year, with the addition of \$250.00 for miscellaneous expenses, thus giving us a budget of \$3,395. The income for the year should be approximately \$3,500.00.

The sum of \$2,899.33 was expended in connection with bills introduced in the Legislature, the same being obtained by the sale of three \$1,000 bonds.

I am herewith submitting a detailed financial statement covering the period from June 5, 1940, to June 14, 1941. Likewise, a certified public accountant's audit of the books from the time they were received by your present Secretary to June 14, 1941. I have available for your inspection audits made by public accountants at the time the funds of the Association were transferred from the estate of Dr. Balsam to Dr. Hawkins; likewise, for the period during which Dr. Hawkins was Secretary of the Association.

During the year, the following new societies were chartered: Lake County, Chouteau County, and Blaine County. Lake County has developed into a very successful society, having nine members, all of whose dues are paid. Chouteau, likewise, has had an active society. I am very skeptical about Blaine County Society and believe that it was organized for the sole purpose of entering into a contract with F.S.A. The dues of but one member have been paid, and unless the rest are paid by the end of the year, it will be necessary to revoke the charter of this society. It is recommended that in the future no charter be granted to a new society except on recommendation of the councillor for the district in which the society is to be organized. Perhaps where a society is organized in a district which was previously under the jurisdiction of a district society, the consent of the district society should be had before a new society is organized.

Our contract with the JOURNAL-LANCET continues for another year.

Our contract with our attorney will expire on the first of next March. The Council should decide whether or not they wish to employ an attorney following this date.

I had hoped to be able to inform the Council as to the amount of funds which will be necessary to publish the Medical History of Montana, which is rapidly approaching completion and will soon be ready for publication; however, as the Historical Committee has submitted no definite figures, it seems advisable that the matter be delayed and presented to the Councillors by letter when the sum necessary is known.

There is a growing tendency for individual physicians or small groups of physicians to form so-called "health associations," for the members of which the physician or physicians furnish medical and surgical services for so much per year. The amount received is often ridiculously low. In certain instances, physicians apparently engage in actual solicitations to secure members in such associations. It seems to me that the Council should pass on the ethics of such practices.

As in other states, there appears to be a tendency on the part of the county and district medical societies to neglect scientific meetings. I am informed that in some of our larger societies, there has not been given, within the last year, a single scientific paper. Possible reasons for this have been mentioned in one of our monthly letters. An active interest on the part of the councillor in each councillor district might do much to correct this situation.

FINANCIAL STATEMENT

June 5, 1940, to June 14, 1941

RECEIPTS	
Cascade County	\$ 361.00
Gallatin County	144.00
North Central Montana	56.00

Lake County	72.00
Hill County	88.00
Chouteau County	32.00
Flathead County	205.00
Silver Bow County	456.00
Northeastern Montana	
Lewis & Clark County	72.00
Fergus County	112.00
Madison County	21.00
Musselshell County	48.00
Mount Powell	160.00
Park-Sweetgrass County	96.00
Yellowstone Valley	492.00
Southeastern Montana	208.00
Western Montana	304.00
Blaine County	8.00
Interest on Bonds	240.00
Great Falls National Bank	3,200.00
Thomas F. Walker	175.00
Cash from sale of bonds	3,379.69
Cash on hand, June 5, 1940	814.93

Total Receipts, including cash on hand	
June 5, 1940	\$10,744.62
Great Falls National Bank (loan)	\$3,200.00
Thomas F. Walker (advanced)	175.00
Cash from sale of bonds	3,379.69
Cash on hand, June 5, 1940	814.93
Dues overpaid	9.00
	<hr/>
	\$ 7,578.62

Net Income \$ 3,166.00

EXPENDITURES	
Secretary's Office:	
Salary	\$ 600.00
Traveling Expenses	12.70
Telephone	62.51
Telegrams	12.50
Printing and supplies	62.00
Stamps and envelopes	82.03
A. M. A. Directory	15.00
Secretary's bond	35.00
Freight	17.39
Post cards	5.00
Express	2.80
Rent, safety deposit box	3.33
Bank charges	8.50
President's Office:	
Miscellaneous expenses, Dr. Gregg	10.00
Refunds	9.00
Commission sale of bonds	3.75
Interest	80.03
Flowers	33.00
Committees	271.34
History	\$ 150.00
Medical Economics	26.29
Medical Practice	9.80
Preparedness	31.50
Executive	53.75
Attorney	327.59
Retainer	\$ 300.00
Expenses	27.59
Expenses delegate to A. M. A.	204.00
Subscriptions to JOURNAL-LANCET	551.25
Expenses 1940 meeting	730.45
Speakers	\$ 378.10
Program Committee	64.91
Miscellaneous	26.70
Programs and badges	179.08
Hotel	60.32
Stenographer	13.00
President's expenses	5.00
Engraving	3.34
Expenses Officers' Annual Visit	103.31
Repayment of loans	3,375.00

Great Falls National Bank	\$3,200.00
Thomas F. Walker	175.00
<hr/>	
Total Expenditures (except Legislative)	\$ 6,617.48
Legislative Expense	2,899.33
Secretary's expenses	\$ 236.97
Telephone	301.11
Telegraph	518.94
Hotel	150.30
Stenographers	214.50
President's expenses	123.75
Office rent	30.00
Multigraphing	29.50
Melvin Hoiness, lobbyist	750.00
Attorney	62.58
Stamps and envelopes	202.62
Printing and supplies	196.33
Expenses of doctors	82.73

Total Expenditures \$ 9,516.81

Total Receipts \$10,744.62
Total Expenditures 9,516.81

Cash on Hand \$ 1,227.81

Total Expenditures	\$ 9,516.81
Unusual Expenditures	6,283.33
Repayment of loans	\$3,375.00
Legislative	2,899.33
Refunds	9.00

Routine Expenditures \$ 3,233.48

BOND ACCOUNT	
Cash from sale of bonds	\$ 3,379.69
Legislative Expense	\$2,899.33
Authorized transfer to checking account	450.00
	<hr/>
	3,349.33

Balance due bond account \$ 30.36

CHECKING ACCOUNTS	
Cash on hand, June 5, 1940	\$ 814.93
Transferred from bond account	450.00
Income (net)	3,166.00
Blance due bond account	30.36

Total in Checking Account \$ 4,461.29
Routine Expenses 3,233.48

Cash on hand \$ 1,227.81

It was moved, seconded, and unanimously carried that the report of the Secretary be accepted and placed on file.

Dr. Cooney gave a brief discussion of the legislative activities of the Association during the past year.

Dr. L. G. Dunlap of the Tenth Councillor District briefly discussed the affairs of the Association.

The following resolution was regularly moved, seconded, and unanimously carried:

Be It Resolved that discussions or actions regarding legislative matters which are taken up in the House of Delegates or Council shall not be published.

Upon motion duly made, seconded, and unanimously carried, it was resolved that the Secretary be requested to send minutes of the Council meeting to the individual councillors and to send the minutes of the House of Delegates to the individual delegates.

Upon motion duly made, seconded, and unanimously carried, the following recommendations to the House of Delegates were made:

1. That the House of Delegates make available a sum of money not to exceed \$100.00 for the payment of traveling expenses of a speaker for that session of the Academy of Otolaryngology which is held in connection with the annual scientific meeting of the Montana State Medical Association.
2. That Sections 1 and 2 of the By-Laws, which require that the dues of all members be paid by the time of the annual meeting, be strictly enforced.
3. That the Historical Committee be requested to submit to the Council the cost of publication of the Medical History of Montana as soon as the same is known. Should the Council approve the expenditure of such amount, it is recommended that the House of Delegates empower the Executive Committee to make such expenditure.
4. That no assessment for dues be levied by the Montana State Medical Association for men who have entered the Army until the first day of January following their return from the Army, the said men who have entered the Army to remain members of the Montana State Medical Association during this time.

By motion duly made, seconded, and unanimously carried, it was decided that no attorney be employed by the Association following the expiration of the contract between the Association and Mr. E. G. Toomey, of Helena, which expires March 1, 1942, until further action is taken upon the matter.

At the request of the Secretary, a committee was appointed to audit the books of the Secretary, such audit to include a study of the certified public accountant audits made at the time the books of the Association were turned over by Dr. Balsam's estate to Dr. Thomas L. Hawkins; also audits made at the time the books were turned over from Dr. Hawkins to Dr. Walker, and of audits made of Dr. Walker's books covering the period from their receipt to June 14, 1941. The Chairman appointed Drs. Hitchcock, Long and Kane to make said audit and requested that they report to the House of Delegates at its meeting, Monday, June 23, 1941.

There being no further business to appear before the Council, the meeting adjourned.

Minutes of the Sixty-Third Annual Meeting of the House of Delegates of the Montana State Medical Association

The meeting was called to order at 9:30 A. M. by the President, Dr. J. I. Wernham. The following delegates presented credentials, which were found to be in order:

Cascade County—H. W. Fuller, L. L. Howard, P. E. Logan, R. B. Durnin, F. K. Waniata.
Yellowstone Valley—C. H. Nelson, L. W. Allard, A. L. Hamerel, R. V. Morledge, R. G. Hanley, H. T. Caraway.
Southeastern Montana—J. H. Garberson, M. G. Danskin, B. C. Farrand.
Lewis & Clark County—T. L. Hawkins, O. G. Klein.
Gallatin County—R. G. Sherer, P. L. Eneboe, R. E. Seitz (alternate).
Silver Bow County—J. K. Colman, A. R. Seivers, J. C. Shields, G. A. Carmichael.
Mount Powell—F. L. Unmack, L. G. Dunlap.
Chouteau County—D. J. Cooper.
Western Montana—J. P. Ritchey, A. R. Foss, L. W. Brewer.
Musselshell County—G. A. Lewis.
Fergus County—E. A. Welden.
Flathead County—H. D. Huggins, A. T. Munro.
Northeastern Montana—R. D. Knapp.
Hill County—L. T. Sussex, W. F. Hamilton.
No delegates were present from the following medical so-

cieties: Lake County, Madison County, Blaine County, Big Horn County.

A review of the activities of the Association during the past year was made by the President. The Secretary was called upon to read the minutes of the last annual meeting. Dr. Caraway moved to dispense with the reading of the minutes. The motion was seconded by Dr. Waniata. Motion was unanimously carried. The Secretary then read his annual report, which follows:

Secretary's Report

I think that all of us will agree that the fundamental object of the medical profession is to make medical care available to our people.

Our pioneer physicians were keenly aware of this fact. They realized that medical care could be divided into two broad divisions: Curative medicine and Preventive medicine; that both of these could and of a right ought to be practiced by the private physician.

As to preventive medicine, however, they realized that in many of its phases, it required the police power of the state and that that part of it which dealt with public health rather than relief of the individual could best be carried out by a public Department of Health.

Hence, the Medical Association of Montana very early took steps which resulted in the creation of the Montana State Board of Health.

Realizing that preventive medicine was a branch of the healing art, and as such, should be under the direction of physicians and as free as possible from the influence of politicians, they saw to it that the members of the State Board of Health should be physicians, appointed by the Governor, but nominated by the Montana State Medical Association.

Thus, we see that our State Board of Health was in reality brought into being by the Montana State Medical Association for the purpose of carrying on the activities of that branch of the healing art which chiefly concerns itself with the prevention of disease rather than the relief of suffering.

The pioneer physicians also realized that some steps must be taken to guarantee to the people of Montana that those who set themselves up as practitioners of medicine were qualified to do so. Hence, the Medical Association was active in the establishment of the State Board of Medical Examiners.

As a result of the foresight of those who brought the healing art to a new territory, we now have two public bodies composed of physicians; the State Board of Medical Examiners, whose function is to see to it that those who practice medicine in Montana are qualified to do so, and the State Board of Health, whose duty is to see that the public health is safeguarded. In addition to these two official bodies, we have the private physician whose duty it is to care for the sick, and to render such aid to the public bodies as lies within their power.

The members of the State Board of Health, the members of the State Board of Medical Examiners and the practicing physician of Montana have banded themselves together in the Montana State Medical Association, the better to accomplish the fundamental purposes of the medical profession.

At the present time, there has been raised the cry that many of our people are without adequate medical care. Also there can be little doubt that in Montana, as throughout the nation, organized medicine is looked upon with suspicion, and that the confidence of the public in organized medicine has been undermined.

If we are to regain the confidence of the public, we must:

1. Determine what the medical needs of the people of Montana are and how well they are being taken care of.
2. Take such steps as are necessary to make available to our people all that "medicine" has to offer.
3. Devote a large amount of time to public relations.

As a preliminary step in accomplishing these objectives, I would recommend:

1. A join survey of the medical needs of the people of Montana carried out by the Montana State Medical Association and the Montana State Board of Health, the results of this survey to be reported to the House of Delegates at its next annual meeting.
2. Occasional joint meetings between the Executive Committee of the Montana State Medical Association and the State Board of Health; also between the Executive Committee and the Montana State Board of Medical Examiners.
3. The employment of a full-time, lay secretary by the Montana State Medical Association.
4. A Committee appointed to study the various Medical Service Bureaus that have been set up by other state medical associations and to work out a plan for such a Medical Service Bureau for Montana, to be presented at the next annual meeting, if the above-mentioned survey shows the need of such a bureau.

With the cooperation between the Montana State Medical Association, the State Board of Health, the State Board of Medical Examiners, and all the physicians of Montana knowing the medical needs of our people and putting forth their best efforts to see that these needs are met, we need to have little fear of political medicine and will be in a position to say to "outside money" if it attempts to dictate to us, that "we are doing very nicely, thank you."

Upon motion made by Dr. C. H. Nelson, seconded by Dr. H. T. Caraway, the Secretary's report was accepted.

The President, Dr. J. I. Wernham, appointed the following committees: *Necrology Committee*—Dr. F. R. Schemm, Dr. L. G. Dunlap, Dr. P. L. Eneboe. *Resolutions Committee*—Dr. H. T. Caraway, Dr. M. G. Danskin, Dr. P. E. Kane.

The President then called for reports of the Committees.

COMMITTEE REPORTS

The following committees submitted no reports: *Hospital*—R. W. Morris, chairman; *Public Instruction and Health*—L. W. Brewer, chairman; *Public Relations*—L. W. Brewer, chairman; *Dentists, Pharmacists and Nurses*—A. R. Foss, chairman; *U. S. Medical Reserve*—W. R. Morrison, chairman; *Postgraduate Work*—F. R. Schemm, chairman; *Fractures*—R. B. Richardson, chairman; *Tuberculosis*—F. I. Terrill, chairman; *State Institutions*—L. G. Russell, chairman.

Cancer Committee

We, your Committee on Cancer, submit the following report and move its adoption.

As in the past, the Cancer Committee has continued its work in Cancer Control. In furthering this project, the Committee has been acting in a dual capacity—First, as Executive Committee for the Women's Field Army; and second, as coordination center and distributing agency for cancer information to the medical profession in the state.

The Women's Field Army has just completed its fifth annual educational campaign on cancer. This organization, under able leadership and with organized units throughout the state, has arranged meetings for the general public at which medical men have appeared as guest speakers. The effectiveness of their endeavors to awaken interest in Cancer Control is evidenced by the increasing frequency with which patients are appearing for earlier diagnosis of questionable tumors. The educational campaign this year has been extended to every county in the state. Funds collected by the sale of memberships in the Women's Field Army provide the means for conducting the educational campaign each following year. The State Commander, Mrs. H. W. Peterson, Billings, and her large staff of officers and

workers are to be congratulated upon the thoroughness of their work and the results which are now becoming evident.

Your Cancer Committee, augmented by other appointees especially interested or skilled in Cancer Control, is the Executive Committee for the Army, supervises the budget and expenditures, advises regarding the medical aspects of the work, and is the connecting link between this lay organization and the medical profession.

As its own project, the Cancer Committee has assembled and furnished to the doctors of the state, latest authentic cancer information as material from which talks may be constructed for presentation at the meetings organized by the Women's Field Army. This information is obtained from the State Board of Health and the American Society for the Control of Cancer, and may be considered entirely reliable. The true value of the assembled cancer data to the medical men of the state has not been determined. An expression is desired by the Committee as to whether this material is used or merely relegated to the wastebasket so that a decision can be made regarding continuation of the practice.

The Cancer Committee is in agreement with the statements of the American Society for the Control of Cancer—that "early cancer is curable," that cancer must be fought with knowledge, that cure and prevention of cancer depends to a large extent upon the spread of cancer information to the public, so as to cause patients to seek early diagnosis and treatment. For these reasons, the Committee recommends the endorsement and active support by the Medical Association of Montana of the April Educational Campaign of the Women's Field Army.

Difficulties occasionally are encountered in obtaining close cooperation between local medical societies and the local workers of the Women's Field Army. Efforts have been made to have local cancer committees appointed in each district and county society, to whom the Field Army workers can report for advice and assistance. The State Cancer Committee recommends that each local society have a cancer committee active at all times, and that the Secretary of the State Medical Association and the Chairman of the State Cancer Committee be kept informed of its membership.

In summary, the Cancer Committee recommends the following:

1. Official vote of thanks to the State Commander, officers and workers of the Women's Field Army for their generous, unselfish, and unstinted assistance in cancer education, and that a letter from the Executive Committee of the Medical Association to the State Commander, Women's Field Army, relay these sentiments.
2. Each county or district society be urged to include an active Cancer Committee in its organization, its membership to be recorded in the offices of the Secretary of the State Association and the State Cancer Committee.
3. The House of Delegates express an opinion on the desirability of continuation of the present method of furnishing cancer information to the medical profession—our recommendations for its improvement.

Cancer Committee, Medical Association of Montana,
CLYDE H. FREDRICKSON, M.D., *Chairman*.

Cancer Committee:

- J. H. Bridenbaugh, M.D., Billings.
- C. H. Fredrickson, M.D., Missoula.
- J. H. Garberson, M.D., Miles City.
- L. L. Howard, M.D., Great Falls.
- R. F. Peterson, M.D., Butte.

The motion for adoption was seconded and unanimously carried. The Secretary was requested to write the State Commander of the Women's Field Army, expressing our thanks to the State Commander, officers and workers of the Women's Field Army; likewise, to notify the County medical societies of the request for the appointment of local cancer committees. The House of Delegates went on record as favoring the furnishing of cancer information to the profession by the Cancer Committee.

Medical History Committee

We, your Committee on Medical History, herewith submit the following report and move its adoption.

The material as compiled by Judge Calloway is in very good form and is now being corrected for medical errors by your Committee. The work comprises 600 pages and with the index and pictures will make a volume of about 650 pages. The history of the State Board of Health and that of Rocky Mountain spotted fever is being compiled and will complete the volume.

The cost of publication can only be determined on completion as the number of plates and illustrations greatly influence the cost per copy. The work should be on the press this year, unless war conditions make it inadvisable to go ahead.

Signed: E. D. HITCHCOCK, M.D., *Chairman.*

J. H. IRWIN, M.D.

T. F. WALKER, M.D.

The motion for adoption was seconded and unanimously carried. After considerable discussion, it was decided that no provision for funds should be made for publication until such time as the committee is able to specify the amount needed, at which time the matter will be decided by the House of Delegates.

Medical Insurance and Legal Affairs Committee

No formal report was submitted. The Chairman, Dr. J. C. MacGregor, called attention to the fact that doctors were failing to report threatened malpractice suits to the Committee. He stated that at the present time there were five threatened suits in Billings. He stated that the insurance companies were always glad to advise with the committee. The doctors requested that as soon as any of our members are threatened with a suit for malpractice, that they notify the committee at once. He stated that in most cases, by contacting the proper physician, the Committee could do a great deal to bring about the abandonment of the threatened suit. He called attention to the fact that in these cases, the physician should be careful not to further antagonize the patient. Dr. MacGregor called attention to the fact that—rumors to the contrary notwithstanding—the members of the Montana State Medical Association had not signed a resolution refusing to give testimony in malpractice cases. Dr. MacGregor stated that his committee had been able to carry on its activities without cost to the Association.

It was moved, seconded, and carried that Dr. MacGregor's informal report be accepted.

Medical Publications Committee

The Chairman, Dr. A. R. Foss, reported that since the contract with the JOURNAL-LANCET did not expire until next year, the Committee had no report or recommendations to make.

Inter-Relations Committee on Scientific Papers

Dr. C. H. Nelson, Chairman of the Committee, reported that the Secretary had furnished secretaries of local societies with the names of men who would give papers before local societies, together with the title of such papers. He urged that all societies feel free to request those whose names appear on the list to give papers before their society.

Program Committee

Dr. T. L. Hawkins, Chairman, stated that while his Committee had not prepared a formal report, they desire to know whether the Association wished to have programs put on by faculty members of medical schools exclusively or if they desired to have members of our Association participate in the program. The following resolution was presented by Dr. F. L. Unmack of Mount Powell Medical Society:

Whereas, there has been no end of pro and con discussion and debate relative to the present operations of the Montana State Medical Association and

Whereas, it is considered by many that the State Medical Association annual meeting is not only a place for the appearance of outstanding teachers but is also a place to allow individual members of the Association to present papers and develop in the profession so that all may feel that they are an important cog in the wheel of Montana progress and

Whereas, we have many brilliant men practicing medicine in the state of Montana whom we all personally love and admire; professionally respect and revere; and outstanding men with unexcelled experience in Industrial Medicine and Surgery, Public Health, Hygiene, Obstetrics, etc.

Be It Resolved, that the Program Committee be presented with the respectful suggestion that one-half of the time of each State Medical Association Scientific Program be assigned to members of the Montana State Medical Association for opportunity to present papers.

After considerable discussion by those in favor of the program as at present conducted and by those who favored the appearance of Montana men on the program, the resolution was amended to read as follows:

That the Program Committee be permitted to use such Montana talent as available for the program in whatever proportion they saw fit.

By a standing vote, the resolution was adopted by a vote of 17 to 4.

Dr. Hawkins said that in conducting the Postgraduate meetings in conjunction with the Committee on Maternal Welfare and Child Health and the State Board of Health, there was a desire to include subjects other than obstetrics and pediatrics. He requested Dr. Cogswell to inquire whether or not funds might be available for this purpose from governmental sources. Dr. Cogswell agreed to make such a request.

Maternal and Child Welfare Committee

Your Committee has been occupied during the year 1940-1941 with three main objectives:

1. The first of these was to cooperate with the Montana Hospital Association in making a study of the facilities for maternal care in the State of Montana.
2. The second was a continuation of our postgraduate education.
3. The third objective was to continue our effort to reduce our maternal and infant mortality.

HOSPITALS

At the request of the Maternal and Child Health Committee of the Montana State Medical Association and the Obstetrical Committee of the Montana Hospital Association, the Maternal and Child Health Division of the State Board of Health was asked to make a preliminary review of the facilities for maternal care in the State of Montana.

There are fifty-nine (59) hospitals and related institutions accredited by the American Medical Association. There are twelve counties without any hospital facilities. There are eight more counties without hospitals approved by the American Medical Association. There are two counties served by Indian hospitals. This leaves thirty-two counties in Montana served by hospitals approved by the American Medical Association. In 1938, 6,982 births or 65.4 per cent occurred in hospitals approved by the American Medical Association; 2,750 births occurred in homes and the balance, 941, occurred in maternity homes or in non-accredited hospitals.

Public Health nurses are assisting in many of the home deliveries. In a few instances, in centers where hospital facilities were provided maternity homes are operating in competition to hospitals. Rates for care in the maternity homes were the same as those charged to patients in the hospital. Some maternity homes provide facilities for osteopaths to deliver patients. A few maternity homes provided care for patients other than those needing obstetrical care. Some so-called maternity homes are apparently abortion shops.

Following this preliminary survey, your Chairman interviewed Senator D'Ewart in regard to the need for licensing and supervision of institutions accepting maternity patients. Senator D'Ewart introduced the bill, and at the Senate hearing, Dr. Edythe Hershey and Dr. T. L. Hawkins appeared before the Committee. The Bill was passed by both the House and the Senate. The rules and regulations will be presented to a joint

committee of the Maternal and Child Health Committee of the State Medical Association, the Obstetric Committee of the Montana Hospital Association, and the State Board of Health. While there will be no question of licensing hospitals eligible for registration by the American Medical Association or the American College of Surgeons, the classification of the hospitals will vary, depending upon standards.

Through the operation of this bill, it should be possible to control the "maternity home" situation which is exceedingly bad in spots. On the other hand, provision will be made to protect the maternity home in the rural districts, as these homes serve a distinct need in many parts of the state.

POSTGRADUATE EDUCATION

In cooperation with the Division of Maternal and Child Health of the State Board of Health, your Committee has formulated a plan for lectures on obstetrics and pediatrics extending over two years. The state has been roughly divided into four quarters: a Northeast, Northwest, Southeast, and Southwest quarters. It is contemplated to bring a lecturer on one of these subjects into four or five centers in each quarter each year, alternating every other year with a speaker on the other subject. The plan of the meetings has been changed somewhat from that formerly used, as it is felt that the proposed plan will enable the lecturer to present his work to a greater number of physicians meeting in small groups with less inconvenience to the local physicians.

Last spring, Dr. Roger Stewart of Seattle lectured on obstetrics in Shelby, Havre, Glasgow, Plentywood and Glendive. Dr. Willard Rew of Yakima lectured on pediatrics in Anaconda, Butte, Bozeman and Helena. One hundred and eighteen physicians registered at these meetings.

Next fall a similar course of lectures will be presented in the Northwestern and Southeastern portions of the state.

MONTANA CONFERENCE ON CHILD HEALTH AND PROTECTION

The second Montana Conference on Child Health and Protection was held in Helena, May 16th and 17th, 1941. Your Chairman served as a member of a Citizens Committee to effect plans for this conference. The conference was dedicated to the children of Montana that their rights may be protected and the strength of the nation preserved through its ability to cherish and advance the principles of democracy.

The attendance included a highly satisfactory representation of service organizations, educators, social and welfare organizations, nurses, dentists, and physicians. There were sixty-eight lay representatives, fifty-two social workers, forty-four educators, sixty-eight nurses, and thirty-two dentists and physicians, each group including a wide range of diverse interests. A wide variety of service organizations covering practically every group interested in child health and protection sent delegates. Welfare, social, and governmental agencies were also well represented.

There were four prominent out-of-state speakers: Dr. Earl R. Carlson, who has devoted his life to the rehabilitation of children suffering from birth injuries; Mrs. Cecelia Heichemer, Child Welfare Consultant, U. S. Children's Bureau, who for the past month has been studying child welfare problems in Montana through the Child Welfare Services of the Department of Public Welfare; Miss Ethel Mealey, Consultant in Health Education, Oregon State Board of Health, and Miss Gertrude E. Carlsrud, R.N., Minnesota Department of Health, who, as Nurse Instructor, is associated with the Minnesota statewide program for improving the care of premature babies.

An immediate outcome of the conference was a request for the Chairman of this Committee to meet with the Board of County Commissioners at their annual meeting, June 9th, to discuss their responsibilities for protection of maternal and child health according to provisions made in the law authorizing them to provide medical and hospital care for those unable to provide such care for themselves. Through this cooperative interest should evolve more efficient procedures in keeping with sound principles of public health, medical practice, and social welfare.

MATERNAL MORTALITY REPORT OF 1940

In 1940, there were forty maternal deaths and three deaths associated with pregnancy reported, as compared with thirty-five maternal deaths in 1939 and five associated with pregnancy. The 1940 rate is thirty-four deaths per ten thousand live births, as compared with the 1939 rate of thirty-two deaths. Complete reports from other states for 1940 are not yet available, but in 1939, the United States rate was forty, with twelve states having a lower rate than Montana. Idaho had the lowest rate, twenty-two, North Dakota and Oregon following with twenty-four. The slight increase in rate may be accounted for, in part, by the fact that with the more detailed questionnaires, several deaths which would have been classified as associated with pregnancy were classified as maternal deaths. All but two physicians returned the questionnaires which were sent out by the Committee. The full report will be made available to the physicians of the state at a later date.

Although the number of deaths is too small to allow for detailed statistical analysis, there are certain definite trends which are significant. Of the forty deaths, there were:

Abortions: Twelve. Nine septic, eight of which were reported as induced by the patient herself or other persons. Three were non-septic abortions, one of which was self-induced.

Puerperal Hemorrhages: Seven. Only three reported the use of transfusions. In one instance, the hemorrhage resulted from inversion of the uterus. This case was attended by a midwife who pulled on the cord. The woman had made application to the Board of County Commissioners for admission to the hospital but was refused hospitalization, and the County Physician in this instance does not assume responsibility for home deliveries.

Toxemia: Seven. Three of these died before delivery, one died after cesarean section was performed because of convulsions which occurred during and before labor. Four died after delivery, and one of these following cesarean; this patient had hyperthyroidism with myocardial damage complicating the toxemia.

Puerperal Septicemia: Six. Three of these were cerebral, coronary and pulmonary emboli respectively, which under the revised classification, are classified as septicemia; one followed cesarean section for disproportion; one was a previously infected case who delivered a second twin breech two days after the first twin was born; one precipitated five minutes after reaching the hospital and the physician was not in attendance.

Accidents of Childbirth: Three.

Other Conditions of Childbirth: Four. Four were known cardiacs who were, apparently, unable to stand the strain of pregnancy. One was not attended by a physician at the time of delivery. One patient had an ectopic pregnancy with profuse hemorrhage and died three days following the rupture. The diagnosis had been made a month before rupture but operation was refused.

Of the forty-three deaths reported in 1940, three were not attended by physicians at the time of delivery. Seventy-three per cent of the births occurred in hospitals and twenty-six per cent were attended by physicians in the homes. Adequate facilities for home deliveries with trained assistance by a public health nurse is a factor to be considered in certain areas of the state.

Last year our maternal mortality rate was a little higher than in recent years. An examination of the questionnaires indicates that abortion is still a most important cause of death. Late hemorrhage is responsible for too many deaths. It is hoped that more hospitals will provide facilities for typing and transfusion.

If we are to emulate the fine record of our neighboring states, Idaho and North Dakota, we must prevent deaths from abortion, hemorrhages, infection, and toxemia. Toxemia was responsible for seven deaths in 1940. It is generally conceded that cesarean section should not be performed on a convulsing patient. Two of the maternal deaths were eclampsics delivered by cesarean section. Cesarean section should be avoided, if possible, after long labors or in poor operative risks.

INFANT MORTALITY REPORT OF 1940

In 1940, there were 524 infant deaths reported as compared with 534 in 1939. The 1940 infant death rate is forty-six per one thousand live births as compared with the 1939 rate of forty-nine. Reports for 1940 from other states are not yet available but in 1939, twenty-nine states had a lower infant mortality rate than Montana, and it is reasonable to assume that we should be able to reduce this rate materially. Since 63 per cent of the deaths were infants who died in the first month of life and approximately 30 per cent of these died the first day, and 55 per cent the first week, it would seem that this problem concerns primarily with the attendant at delivery. The care and attention given the newborn, especially the prematurely born baby is, of course, equally important. Induction of labor should not be considered too lightly, neither should labors be terminated unnecessarily by operative means. In addition to the infant deaths, there were 230 stillbirths reported and this again is closely associated with the care of the mother in the prenatal and natal periods. The stillbirth rate has remained between two and three per hundred live births over a period of years. The importance of routine Wassermanns before the fifth month of pregnancy cannot be minimized.

Approximately 30 per cent of the death certificates for infants gave prematurity as the cause of death. The Maternal and Child Health Division of the State Board of Health will soon be ready to deliver incubators to those hospitals desiring them. We now have orders for twenty incubators, and these will be sold to the hospitals at \$100, which is considerably less than cost. The unfortunate delay in building, resulting from many factors, is compensated by careful tests that have been run on all instruments. Tests have been made so that instructions can be given for the most efficient and economical use of oxygen. Each incubator will be tested individually before it is placed in a hospital. The Maternal and Child Health Division of the State Board of Health will provide a nurse who has had postgraduate training in pediatrics and premature care at Michael Reese Hospital. This nurse will be available for training the personnel in any hospital desiring such service. Dr. Gillespie has given considerable time and thought to this problem and feels that by the first of September, the program should be underway throughout the state.

Pneumonia and upper respiratory infections are also an important cause of infant deaths. There are comparatively few infant deaths resulting from diarrhea. Among the infectious diseases, whooping cough is generally the greatest offender in this age group.

The fact that the physicians returned 89.2 per cent of the questionnaires on stillbirths and infant deaths indicates their interest in this problem. A complete analysis is being prepared and will be sent to each physician when available.

These studies will be significant only after comparisons are available for at least five years and the studies are therefore being continued.

Your Committee wishes to express their appreciation for your interest and cooperation. In addition, we wish to recognize the untiring efforts of Dr. W. F. Cogswell, Secretary to the State Board of Health, and of Dr. Edythe Hershey, Director of the Division of Maternal and Child Health in the interest of our mothers and children.

After the Committee had been commended for the excellent program it had carried out and for the completeness of its report, the report was, upon motion duly made, seconded and unanimously carried, accepted.

The meeting was adjourned at 12:15 P. M. until 1:30 P. M., Monday, June 23, 1941.

Adjourned meeting was reconvened at 1:30 P. M., Monday, June 23, 1941. The meeting was called to order by President J. I. Wernham, who called for a report of the Military Preparedness and Defense Committee.

Military Preparedness and Defense Committee

Dr. H. T. Caraway, Chairman, said that the Committee had no formal report to make at this time. He explained that the Committee was formed at the request of the American Medical Association and is actively engaged in assisting the Preparedness Committee of the A. M. A. in its attempt in classifying physicians and completing the questionnaires relative to the availability of physicians from each locality. Dr. Caraway stated that the Committee anticipates considerable work in the near future on these matters and requested the cooperation of all component medical societies.

Medical Economics Committee

This report was divided into two parts. That part which deals with the relations between the Montana State Medical Association, its component societies, and the Farm Security Administration follows:

We are living in an age in which our social, economic and governmental customs are rapidly undergoing change. This, in one sense, is quite normal. Change is one of the laws of nature. We cannot stop the changes in nature and in the social order, but it is our duty of this generation to guide and direct its changes in proper channels; it shall become the duty of you young men of the next generation to do likewise. Fear not the changing order but direct its forces, and we of the medical profession have nothing to fear.

Your Economics Committee in rendering this report are endeavoring to smooth out the misunderstandings and misinterpretations of the agreement between the Farm Security Administration and the local Medical Societies; most of those misunderstandings and difficulties have arisen through a misinterpretation of the contract and agreement.

A generation ago complete medical care consisted of the services of the general practitioner who had no laboratory or X-ray to assist him. That age is past. According to a master contract and agreement entered into between the Farm Security Administration and the Montana Medical Association, we have agreed to furnish complete medical care to a certain low income group. It is the understanding of your Committee and of the Officers of the Medical Association of Montana, also of the Administrator of the Farm Security Administration, that complete medical care includes the services of the family physician, specialist, X-ray and laboratory. In other words, that this low income group is to receive the same kind of medical care as our private patients receive. According to this contract and agreement, we must furnish complete medical care, including laboratory and X-ray work. If we do not, or if any local society does not, we void the contract and the Farm Security Administration would then have a legal right to cancel the contract and agreement and call for the return of the funds to their clients.

Your Economics Committee believes that this changing order in the practice of medicine should be controlled and directed by the medical profession itself. The change we cannot stop. If the profession does not direct and control these changes, they will be directed and controlled for us by the politician. It therefore behooves us, as a professional group, to adjust our differences and try and endeavor to make the agreement entered into between the Farm Security Administration and the Medical Association of Montana function harmoniously. The fact is, there is no misunderstanding or disagreement between the medical profession and those who administer the Farm Security Administration. The difficulties and disagreements are in the medical profession itself. These disagreements are not serious and it is the belief of the Economics Committee that everyone can arrive at an understanding and a manner of so conducting himself that these disagreements will be rectified.

The Medical Association of Montana entered into this agreement with the Farm Security Administration for the purpose of furnishing good medical and surgical care to a certain low income group. It was also the desire of the medical profession and the Farm Security Administration that this agreement be administered and conducted uniformly throughout the state. We of the profession desire this uniformity in order that at the end of three or five years, we will have reliable information on which to base the cost of group medical practice, if such a

condition is forced on us. In other words, we deemed it wise to take time by the forelock and place our house in order, and prepare for any eventuality in the line of socialized medicine.

It is our belief that the local medical societies and those who administered the plan did not wholly appreciate this idea. It is our opinion and recommendation that all medical societies operating under this master agreement between the Farm Security Administration and the Medical Association of Montana, in rendering their bills, adhere strictly to the adopted fee schedule of the Medical Association of Montana. In other words, it should be uniform. If the present fee schedule is not adequate, the changes should be made by the Medical Association of Montana and not by any local society. In other words, the fee schedule in regard to rendering bills under this agreement should be adhered to with no deviation downward.

Your Committee believes that the fee schedule as it stands may be adequate, but your Committee also believes that the general practitioner or family physician and surgeon, who makes the house calls, who makes the diagnosis, who drives the long county roads, does not receive a just compensation as compared with the specialist, the general surgeon, and the laboratory technician. Each local society should take the above facts into consideration in pro-rating the money, but the fee schedule should be strictly adhered to in rendering the bills.

On May 4, 1941, Mr. Thomas Horsford and his office force met with your Economics Committee in Helena, Montana, for the purpose of smoothing out certain misunderstandings in regard to the agreement. The following recommendations were agreed to:

1. Medical services rendered to Farm Security Administration clients for the payment of \$30.00 per year shall be limited to man and wife and dependent children under 21 years of age, not gainfully employed elsewhere; provided however, that one additional child over 21, actually engaged in operating the farm, may be included by the payment of an additional \$12.50 a year.
2. Renewals for those who have received medical services under this contract shall be denied after a lapse of 90 days.
3. Membership in Group Health Associations shall not be open to farmers, whose only connection with the Farm Security Administration is through a cooperative loan, without consultation and approval of the auditing committee. This applies both to new memberships and renewals, but is not to be construed as eliminating farm families of very low income who have been farmers, tenant farmers, or farm laborers.
4. Farm Security Administration clients shall receive medical services from the physician and surgeon of their choice, whether or not that physician and surgeon resides within the county boundaries or jurisdiction of the local medical society.

Likewise, a patient may be referred by a physician and surgeon for consultation, special work, etc., to a physician and surgeon in another locality. Professional ethics must be adhered to and when the work called for has been completed, the patient must be referred back to his family physician and surgeon.

In case of accidents, a member of the Health Unit may call upon the closest available physician and surgeon and his bill will be pro-rated the same as a participating physician.

The Farm Security Administration client shall make his payment to the county or local medical society of which the physician and surgeon of his choice holds membership.

The Farm Security Administration client's name must be approved by the auditing committee of the local county medical society of which the chosen physician and surgeon is a member.

It is the recommendation of your Economics Committee that the larger the area covered, the greater the number of counties in a group administered by one director and auditing committee, the more harmonious and efficient the agreement will function.

- J. C. SHIELDS, M.D., *Chairman*
- F. F. ATTIX, M.D.
- J. H. GARBERSON, M.D.
- R. B. DURNIN, M.D.
- J. P. RITCHEY, M.D.

On recommendation of the House of Delegates, which met in Butte two years ago, your Economics Committee took up the study of group hospitalization and by the same House of Delegates, it was voted unanimously to recommend to the hospitals of Montana to endeavor to form a group hospital service plan for the state. Following out the recommendations of the House of Delegates, your Economics Committee assisted the hospitals in organizing a non-profit group service plan for hospitalization.

On February 15, 1941, the Non-profit Group Hospital Service Association began operation in Helena. The experience in Helena to date shows that this has proven financially sound for the City of Helena, but will not furnish money for promotion work throughout the state.

In January, 1941, when the House of Delegates met in Butte, Montana, your Committee recommended a loan or gift to the Non-profit Hospital Service Association for promotion work. At the present time, your Economics Committee has no information as to what the final action was in regard to this loan.

It is our recommendation that the present House of Delegates take final action on this matter.

- J. C. SHIELDS, M.D., *Chairman*
- R. B. DURNIN, M.D.
- J. H. GARBERSON, M.D.
- F. F. ATTIX, M.D.
- J. P. RITCHEY, M.D.

The Economics Committee of the Montana State Medical Association recommends that inasmuch as only 50 per cent of the component societies voted on the question of making a loan to the Montana Hospital Service Association and in view of the additional fact that less than 50 per cent of the members of the Montana State Medical Association voted on the question of making a loan to the Montana Hospital Service Association, that the House of Delegates do make such a loan to the Hospital Service Association. Dr. T. L. Hawkins made the additional recommendation that the money for such a loan be borrowed from a bank, pledging as security, bonds held by the Montana State Medical Association. By motion duly made, seconded, and carried, by a vote of 17 for to 4 against, the above-mentioned resolutions were adopted, and the Secretary was instructed to carry out their provisions.

Orthopedics Committee

Dr. L. W. Allard, chairman of this committee, gave an informal report and stated that since the work of the Crippled Children's Division of the Montana Welfare Board was being transferred to the Montana State Board of Health, there was not much that could be done until such transfer had been completed.

Special Committee on Medical Service Bureaus

Dr. R. G. Lemon, acting for Dr. M. A. Shillington, who had been appointed a committee of one to report on Medical Service Bureaus, gave a very excellent resume of the various medical service bureaus that have been set up by or in connection with state medical associations in various states. Dr. Lemon was highly commended for the excellent work he had done and upon motion regularly made, seconded, and unanimously carried, it was resolved that the report be referred to the Medical Economics Committee. The report follows:

In 1938, the private practice of medicine was jeopardized by activities which culminated in an abortive attempt to establish a national health plan. This was brought about by the assertion of certain Federal Agencies that a large group of our population was not receiving adequate medical care.

Many state-wide surveys have been made in the various states to determine whether or not adequate facilities exist to provide proper medical care to all groups of the population. The trend of these reports seems to indicate that in a majority of cases, adequate facilities do exist. If, however, there is any defect in our present system, it is among the low income group. These people are decent, self-respecting individuals who are self-supporting under ordinary circumstances, but to whom a serious illness or surgical operation is a financial catastrophe. They are above the level of true indigency but may sink to the level of medical indigency in the face of a large, unexpected medical or surgical fee.

It is in this group of citizens that some form of pre-payment medical service is particularly desirable.

In the fall of 1938, your Medical Economics Committee, prompted by the Farm Security Administration, studied the question of adequate medical care for clients of the FSA. The result was that an agreement was entered into whereby the clients receive benefits in exchange for payment of certain fees. This, in the first year of operation, has apparently been worthwhile to both farmers and physicians.

This has been a membership prepayment plan with the benefits limited to one single group of people. There is now discussion from various sources to the effect that there should be some agreement which would be broader in its scope.

Because of this, I have been asked to review the experience of other states which have instituted insurance plans and to prepare a report for this House of Delegates.

According to the Bureau of Medical Economics of the American Medical Association, there are some twenty-one states that have made some sort of a start on prepayment medical service plans. Most of these, however, have not yet gone into operation. In most cases, these plans are the outgrowth of several years of careful study by various state medical societies concerning the costs of medical service to the people of their state and have involved the expenditure of many thousands of dollars.

There are certain preliminary considerations in preparing a medical service plan which must conform not only with the existing professional principles of the practice of medicine, but also with the present corporation and insurance laws of the state. These considerations include the following:

1. Creation of a non-profit entity to use patients' funds for their benefit only.
2. Maintenance of the principle of freedom of choice of physician by each patient.
3. Creation of a type of organization that would keep administrative costs at the lowest possible figure consistent with efficiency and normal growth.
4. Maintenance of control of administration and policy in the medical profession.
5. Availability of the service to all state residents falling within the restricted income groups.
6. The scope of the medical service provided to be as broad as possible.
7. District administration so far as possible to be maintained in order that local desires may be adhered to wherever possible.

Without exception, all of the prepayment medical plans studied have come to the conclusion that a non-profit corporation is the most feasible type of organization. The two questions which immediately face such a non-profit corporation for prepayment medical service are: first, whether such a corporation would be unlawfully practicing medicine and surgery; second, whether the provision of medical service on a prepayment basis was the practice of insurance under the existing laws of the state.

In many states, these questions have been resolved by passing enabling legislation specifically authorizing the formation of non-profit medical service corporations. This places the supervision of the voluntary prepayment plan under the State Department of Insurance, but at the same time recognizes a basic difference between a contract for service between a group of practitioners and subscribers and a contract of insurance between a corporation guaranteeing to indemnify policyholders for a monetary loss.

In California, existing judicial precedent led legal investigators to conclude that a non-profit membership corporation which agrees to defray the costs of medical care but does not undertake to restrict its members' choice of physician and surgeon, is not unlawfully engaging in the practice of medicine and surgery.

By similar court precedent, it was held that the pooling of funds to defray the cost of medical services did not constitute insurance in California.

Insurance plans should be avoided if possible, for various reasons. Insurance companies are generally subjected to a tax on gross premiums collected, and in addition, to incorporate as an insurer considerable funds are necessary as statutory reserves. In the non-profit corporation type of organization, the use of the "unit system" or pro-rata method of payment removes the contingency of expenditures exceeding income and hence removes the necessity for large reserves.

After deciding upon the type of organization which best fills the requirements of a voluntary prepayment medical plan, namely, a non-profit membership corporation, the next step is to formulate the organization and administrative details of operation. Again, existing state laws may influence the structure of the non-profit corporation.

The administration of each medical plan reviewed varies in detail but all are along the same general lines. The corporation generally consists of three classes of membership, the administrative, the professional, and the beneficiary members.

In New Jersey and in Michigan, the administrative members are limited to the Board of Governors or Board of Directors respectively and are elected by the Trustees of the Medical Society of New Jersey or the House of Delegates of the Michigan State Medical Society respectively. Provision is made that about one-third of the Board are selected from the general lay public. In California, the administrative members are elected by the professional members from each of twenty-one administrative districts. They in turn have the privilege of voting for the members of the Board of Trustees.

The corporate officers are elected by the Board of Directors or Trustees and include a President, Vice-President, Secretary, and Treasurer. A Medical Director is appointed by the Board to take charge of administrative details. In some states, he is compensated as a part or full-time employee. Each county or district in the state has a branch office which is supervised by a deputy medical director or a regional committee.

Each physician desiring to participate in the activities of the medical service applies for registration and agrees to abide by its Articles of Incorporation, By-Laws, and regulations. He agrees to furnish reports of services rendered to subscribers and to accept compensation for such services in accordance with the regulations as set forth by the medical service plan. He also agrees to carry malpractice insurance in designated amounts while a professional member. Each medical service plan contains a clause expressly providing that the medical corporation is not answerable for the negligence of any professional member. Each professional member is acting independently so that he alone is responsible to his patient. The participating physician's responsibilities to a subscriber are the same as the relationship to a patient attended in private practice.

In each corporation a fee bill or schedule of benefits has been compiled, usually with the assistance of many medical committees, so as to be equivalent to the prevailing charges made by doctors of medicine in the state for persons in the particular income group which the plan proposes to serve. These schedules naturally vary considerably in the different states.

Membership requirements in the beneficiary group also vary in the different service plans but they are limited to two classes: namely, a single person or the head of a family, and dependents, including spouse and children not over 18 years of age. Eligible subscribers must be employed persons, with the exception of their dependents, and must either be residents of, or employed in the state. In a few states, an age limit of 65 years is set. In the majority of states, a subscriber to be eligible must have an annual income of less than a certain arbitrary amount. This amount ranges from about \$1,500 to \$2,000

for a single person with provision for additional income allowances for dependents, the latter being about \$500 for the first dependent and \$200 for each additional dependent. In Michigan, individuals or families with annual incomes above \$2,000 or \$2,500 respectively, are eligible to enroll but may be required to pay additional amounts to the doctors from whom they receive medical or surgical care.

In all the service plans studied, subscription of membership has been primarily on a group basis. In California, eligibility for beneficiary membership is restricted to persons affiliated with some bona-fide group of five or more. Employed groups are preferred, but any other group not created solely for the purpose of securing medical services may be acceptable. Aside from the matter of distribution of risks, one purpose of this requirement is to reduce collection costs to a minimum, thereby lessening the risk of inadequate income.

In New Jersey and Michigan, there is a minimum group requirement of ten persons with a common employer, with the further requirement that at least 50 per cent and 75 per cent respectively of these employees, whose incomes fall within the maximum limits, must enroll. In Pennsylvania, any group under ten subscribers must have 100 per cent of the entire group enrolled. The minimum percentage requirements for larger groups varies from 80 to 40 per cent inversely with the size of the subscribing group. New Jersey and Pennsylvania provide for special groups, other than those of a common employer, as well as for individuals but these are considered only on the basis of a physical examination. The latter state charges members of these groups or individuals \$5.00 above that charged for ordinary group subscriptions to defray the cost of such medical history and examination.

Each applicant signs an authorization for his employer to deduct the monthly subscription rate from his monthly payroll and to remit this amount to the state medical service. He agrees that the physician is to furnish reports to the state medical service relating to diagnosis and medical services rendered. He agrees, also, to pay to the state medical service up to the first \$5.00 for medical charges incurred in any subscription year year for services under the medical plan.

Deductible agreements are included in nearly every plan. Rapid reduction of cost by this method has been well demonstrated by the automobile insurance companies in their forms of collision insurance. Suggestions have been made for deductible forms ranging from \$5.00 to \$25.00 in order to reduce the premium cost, but it is recognized that these higher deductible forms would take care of catastrophic illnesses only.

Two or more divisions of beneficiary membership having different benefits and different dues rates are usually provided for. Michigan offers a surgical service and a combination medical and surgical service. Under the surgical plan, the subscriber is entitled to receive, when a bed patient in a hospital:

1. Surgical services consisting of operative and cutting procedures and including treatment of fractures and dislocations.
2. Diagnostic X-ray service not to exceed \$15.00 in any one subscription year.
3. Maternity services after the certificate has been in force for twelve consecutive months.

These services do not include medicine, appliances, supplies, or the services of dentists or hospitals. There is a maximum total value of \$150 for all surgical services occurring during any one continuous period of disability or resulting from the same or related causes in successive periods of disability. The monthly subscription rates for membership in the Michigan surgical plan are as follows: Individual membership, 40 cents; membership for husband and wife, \$1.00; family membership, \$2.00.

Subscribers under the Medical and Surgical plan are entitled to both medical and surgical services as follows:

1. Medical and surgical care including home, office, and hospital visits.
2. Consultation services and special medical services such as X-ray, laboratory and anesthesia.
3. Obstetrical services after membership for a period of 12 consecutive months.

4. Medical services necessary to establish a diagnosis for tuberculosis, venereal diseases, cancer, and nervous and mental diseases. Only the initial operative and radiologic treatment is provided for cancer.

The subscriber is entitled to the services provided but must not exceed in any one subscription year a maximum of: \$325 worth of service for individual subscribers, \$550 for husband and wife, and \$875 for a family. Medical service is not provided for alcoholism, drug addiction, self-inflicted injuries, or for conditions where compensation or medical services are available to the subscriber without cost under laws of federal, state, or local governments. Medical care is included for the treatment of conditions existing prior to the effective date of the certificate except that in the medical plan only, treatment will not be provided for appendicitis or hernia if the subscriber has previously suffered attacks for these conditions.

Provision is made to pay for emergency services rendered by a physician to a subscriber traveling outside the state at the prevailing rate for such services.

The monthly subscription rates for membership in the Michigan medical plan are as follows: individual membership, \$2.00; membership for husband and wife, \$3.50; family membership, \$4.50.

In California, two divisions of beneficiary membership were created which are identical in all respects excepting that in the second division the beneficiary must pay the cost of the first two ordinary visits to any professional member for any one illness or injury. At present, dues for the first division are \$1.70 per month. Dues for the second division are \$1.20 a month. Beneficiary membership includes all medical and surgical services with certain limitations very similar to those for the Michigan plan.

Among benefits not included in the various plans, a great deal of similarity exists. In most cases, an attempt is made to offer as broad a program of medical service as possible with as few limitations as are absolutely necessary. On the broadness of the plan necessarily depends the monthly subscription rates. In the absence of applicable actuarial experience, there is little information available to aid one to compute the amount per member per month needed to meet fully the costs of medical service in a free choice of physician plan. In organizing such a non-profit medical corporation, a careful study of the financial experience of the already existing services must be made and upon this, the new organization should be patterned. Most of the financial data so far available is tentative. Michigan Medical Service Corporation was organized in March, 1940. It reports that during the months of June and July, income was more than sufficient to pay physicians at the regular "Schedule of Benefits" established for subscribers, and also to meet the full operating costs of the Michigan Medical Service.

The Dallas County medical plan which is patterned after that of Michigan reports a very satisfactory experience in that after payment to physicians for all medical care and payment of administrative costs, it has been able to put approximately 20 per cent of the premiums in reserve.

The report of the first year and a half of operation of the California Physicians' Service ended December 31, 1940, shows that growth in membership has been slower than anticipated. The service has to be sold and contracts made with groups, a process which often requires long negotiation. The initial expense was considerable. This was taken care of by loans from the California Medical Association and by professional membership registration fees. Not until November, 1940, did the income meet the costs of administration and payment of medical fees. Payments to physicians are made on the "unit system" and since June, 1940, the value of the unit has become \$1.35. This does not represent an adequate payment of physicians. They are optimistic, however, and feel that certain changes in their system and more experience in administration will solve their difficulties.

I have endeavored in this brief report to outline the structure and workings of some of the better known non-profit medical service corporations. I have said nothing regarding hospitalization service groups because that is a distinct field in itself, although one which is intimately related to medical

service. Most states with a medical service plan also operate some type of hospitalization organization but that is done separately.

Medical service organizations are still in their experimental stages and much remains to be learned about them. I believe they have a future and that in time they will bridge the gap in medical service between downright indigency and ability to pay adequate medical fees. We, as physicians, must never lose control of our profession to lay or political groups and for this reason it is up to ourselves to establish our own service organizations before someone else does it for us.

I would suggest to this House of Delegates that this matter be referred to the Medical Economics Committee and that they be asked to investigate the question and report back their findings as to:

1. Is there need in Montana for an insurance plan which will ease the financial burden of sickness from the middle and low-income groups.
2. If so, is such a plan feasible of operation in this state and then if indicated, make such recommendations as to:
 1. Legal steps to be taken.
 2. Type of organization and methods of administration.
 3. Scope of the plan which we should undertake.
 4. Scale of membership premiums to be charged.
 5. Schedule of benefits provided the participating physicians.

Committee on Industrial Hygiene

Dr. L. T. Sussex gave the following report, which, upon motion duly made, seconded, and carried, was accepted.

The Committee on Industrial Hygiene of the Montana State Medical Association consisting of L. T. Sussex, chairman, Harold Schwartz, J. B. Frisbee and A. T. Haas, begs to report as follows:

No formal meeting of the committee has been held during the year, but this is an important committee and its work should be continued and extended.

We make the following recommendations at this time:

1. That the State Association adopt as fully as possible the program outlined by the Council on Industrial Health of the American Medical Association.
2. That the physicians of the state cooperate fully with the Industrial Hygiene Laboratory at Helena and make use of the facilities that are available.
3. That Industrial Diseases be reported to the State Board of Health as required by law.
4. That, if possible, a delegate be sent to the Annual Congress on Industrial Health.
5. That a Committee on Industrial Health be established in each County Medical Society.

As a part of this report, Dr. I. M. Farner, Director of the Industrial Hygiene Laboratory, is here and will speak to you in reference to the work of the Laboratory and the reporting of Industrial Diseases.

Dr. Sussex then presented Dr. Farner, Director of Industrial Hygiene, Montana State Board of Health, who read a paper on "Occupational Disease Reporting." His report follows:

Because of the nature of this meeting and the large amount of business before this body today, I shall confine my remarks to a very few minutes. Two years ago, had I been talking before you in industrial hygiene, it might have been necessary to go into some discussion of what industrial hygiene is all about. Now, however, that seems unnecessary because of the change in viewpoint of the medical profession from traumatic surgery to health maintenance, and the creation of the Council on Industrial Health of the American Medical Association which has been responsible for informing the profession on industrial hygiene through the *Journal of the American Medical Association*. The formation of this national council was followed by the creation of the Industrial Hygiene Committee of our own state association, which committee has shown the Division of Industrial Hygiene of the State Board of Health full cooperation in promoting the health of the industrial worker.

"The Council on Industrial Hygiene was quick to appreciate the greater abundance of opportunities for the ethical practice of medicine in industry and the large segment of industry yet available to the general practitioners of medicine for service of a profitable nature."¹ This segment referred to represents over 90 per cent of the industrial workers in Montana. This means that over 90 per cent of the workers in Montana are getting their medical attention from their family physician and not from industrial physicians. In view of this fact, it becomes apparent that the private physician must become the keystone of any efforts to control occupational disease. It is the aim of your Committee, our National Council on Industrial Hygiene, and the State Board of Health, to assist you in best serving this group of workers.

Many occupations are known to have injurious effects on the physical condition of workers employed in them. Examples such as lead, arsenic and manganese poisoning as well as exposure to dust, acid fumes and vapors are but a few of the toxic materials encountered in Montana industries.

Industrial physicians have reported on all sides the ability to diagnose many an obscure case through directing their attention to the patient's occupation as a possible factor in his illness. Permit me to illustrate how this might work.

A man who works in a garage, suffering from continuous headaches, visits his physician, who after careful examination, is unable to find cause for the patient's illness. Physical findings including a thorough examination of the patient's eyes, ears, and sinuses remain negative. A correct diagnosis in a puzzling case such as this is much easier to determine when the occupation is ascertained and the potentially toxic materials encountered in that occupation are considered. In the case of a garage worker, he is exposed to gasoline, carbon monoxide, lead, and tetraethyl lead. In this case, all of these poisons are capable of producing headache. The next logical step is to determine which of these materials, if any, exists in toxic amounts in the plant where this patient is employed.

This step, of course, calls for a specialized type of work. Here is where the Board of Health can assist by visiting the plant on your recommendation and determining any harmful exposure. Armed with this data, we can then take steps to eliminate these hazards through promoting installation of proper ventilation or other control measures commonly used in industrial hygiene control work.

"It is not to be expected that the practitioner can make himself fully conversant with all the different processes and conditions of work encountered in industry. He may, however, acquaint himself with those presented by industries operating in his own immediate district. It is important that he should do so, for the family physician who attends industrial workers is often faced with problems arising out of the occupations his patients follow. Not infrequently, in the individual case, his advice respecting employment does much to determine whether a workman maintains his economic independence or becomes, either partially or entirely, a public charge."²

Conscientious reporting of occupational diseases to the State Board of Health, as required by law, will serve a two-fold purpose. It will assist you in diagnosis by keeping occupations before you, and will assist the Board of Health in eliminating occupational diseases in a similar manner as is familiar to you all in connection with communicable disease control work. The first step in eliminating occupational disease is to know where the disease exists. The next step is investigation of conditions which are believed responsible for causing the illness. This usually amounts to chemical and engineering studies of the working environment to determine the presence of and amount of toxic materials to which the worker is exposed. The ultimate step in eliminating occupational disease is, of course, to eliminate exposure of workers to toxic materials. This may be accomplished by substitution of non-toxic materials for toxic ones, or controlling the escape of the toxic material into the air breathed by the worker through appropriate ventilation or enclosure.

¹Selby, C. D.: The Renaissance of Industrial Hygiene, A.P.H.A., October 8, 1940.

²Riddell, A. R.: Problems which Arise in the Handling of Illness among Wage Earners, Canadian Public Health Journal, May, 1940.

The reporting of occupational diseases concerns this group particularly since Section 3, Chapter 127, of the Laws of Montana, Twenty-sixth Legislative Assembly, states, "The secretary of the Division of Industrial Hygiene is hereby authorized and directed to design and provide suitable blanks for reporting occupational disease and prepare instructions for their use, and to furnish them free of charge to all registered physicians, medical clinics, hospitals, industrial plants and labor unions who may request them." Sections 7 and 8 of this law require the above-mentioned groups to report all cases of occupational disease seen by them after the secretary of the Division of Industrial Hygiene requests, and provide a penalty for any person required to make such report who shall fail to make said report or who shall willfully make any false statement in such report.

A form for reporting of occupational disease by physicians and others has been prepared. Through the Industrial Hygiene Committee of the Montana State Medical Association, an invitation to present this form here, together with the plan for its use, was arranged. Dr. Sussex, Chairman of the Committee, has indicated that following this meeting, it might be advisable to hold meetings on industrial hygiene in the local medical societies, particularly in the more industrialized areas. In the event such meetings are held, it might be advisable to present briefly the medical, engineering and chemical aspects of industrial hygiene, as well as to introduce the occupational disease report forms. It has been suggested that it might be of interest to demonstrate certain of the field equipment used in connection with testing the work-room environment for presence of toxic substances. The State Board of Health will be happy to cooperate with your Committee in this connection.

These occupational disease report forms are to be distributed by mail, five copies to each physician in the state, immediately following this meeting. Additional forms will be supplied as requested. An earnest effort has been made to make these forms simple as is possible to get the information necessary to carry out desired analyses. It is my desire to visit all physicians in the state from time to time with the view that such visits will lead to a more complete understanding among the profession of industrial hygiene work in general and a thorough appreciation of the importance of reporting all occupational diseases to a central agency.

Permit me to indicate briefly in reiteration how reporting of occupational disease will help to prevent lost time from industry and its related ills to both labor and industry. If a patient develops lead poisoning, carbon monoxide poisoning, or any other occupational disease and the Division of Industrial Hygiene is informed of it, we are in a position to visit the plant, make engineering and chemical studies to determine the source of the toxic material, the amount present, and take steps to eliminate it by instigating proper control methods. This will prevent further cases of disease from the same plant. At the same time this investigation is being made in the plant, other hazardous materials or practices may be observed and eliminated before they result in injury to the workers. Likewise, diseases resulting from one industry may suggest hazardous conditions in similar plants and lead to their study and subsequent removal.

The fact that new methods and new materials are constantly being introduced into industry makes constant vigilance necessary. The reporting of occupational disease in Montana may well prevent a great deal of illness and death, not heretofore recognized as being preventable or related to occupation.

The President, Dr. J. I. Wernham, introduced Mrs. R. E. Mosimen, Women's Auxiliary to the American Medical Association, Seattle. She stated that they now have 27,000 members and are 22 years old. The Women's Auxiliary was organized in 1922. They try to promote aims of the American Medical Association in respect to health. There are 40 states organized. There are two units here, Helena and Missoula, and Great Falls is now organizing. In 1937, permission was granted by the State Association in Montana for organizing

a Women's Auxiliary. A state Auxiliary to the Women's Auxiliary was appointed by Dr. Wernham. They are Dr. W. E. Long, Dr. L. T. Sussex and Dr. T. F. Walker, who are to cooperate with the Women's Auxiliary in forming a Women's Auxiliary here. The Advisory Council directs the Auxiliary.

Committee on FSA Fee Schedule

Dr. J. H. Irwin, chairman of this committee, submitted his report, which upon motion duly made, seconded and carried by a vote of 14 for and 1 against, is referred to the Medical Economics Committee.

Dr. T. F. Walker, Secretary of the Association, presented the report of the Council (*see minutes of meeting of Council*), which, upon motion duly made, seconded, and unanimously carried, was accepted. The following report of the Auditing Committee of the Council was made.

Auditors' Report

We, your Auditing Committee, beg to submit the following report:

The auditors' report of May 27, 1937, shows that all accounts of Dr. Balsam, as Secretary, are accounted for and are correct.

Funds transferred to Dr. T. L. Hawkins as shown by audit of April 6, 1938, are all accounted for and are correct.

The audit of April 1, 1941, to June 14, 1941, for Dr. T. F. Walker, as Secretary, are correct and all bonds and cash are accounted for.

E. D. HITCHCOCK, M.D.
P. E. KANE, M.D.
W. E. LONG, M.D.

The following resolution was introduced by Dr. F. L. Unmack, of Mount Powell County Medical Society:

Whereas, There has been no end of comment about an "inner circle" of medical politicians in the Montana State Medical Association and

Whereas, it is thoroughly well-known and conceded that all members are working in the interest of peace and harmony and

Whereas, many individual members have felt that they were merely on the outside looking in,

Be It Resolved, that the House of Delegates in convention assembled support the proposition and make any necessary changes in the constitution and by-laws of the Montana State Medical Association that henceforth a nominating committee consisting of five past presidents, present at the meeting, residing in the state, and chosen by the President, shall nominate candidates for elective offices in the Montana State Medical Association, and

Be It Further Resolved, that a minimum of three men be nominated for each office—two by the nominating committee and at least one from the floor, and

Be It Further Resolved, that all nominations be completed the first morning of the session and voted on in the afternoon before the close of the meeting.

After a very free discussion, Dr. R. V. Morledge, from Yellowstone Valley Medical society, moved that the President be empowered to appoint a nominating committee of three, such committee to name two candidates for each office, in addition to which candidates could be nominated from the floor. Dr. Durnin introduced an amendment to the motion, which read as follows:

At least two months before the time of election, the county medical societies shall be invited to submit names of candidates for the various offices, to the Nominating Committee. From the names submitted, the Nominating Committee shall make a selection of the names to be submitted by them to the House of Delegates.

A motion to adopt the amendment was regularly made, seconded, and carried by a vote of 17 to 2. The motion as amended was then submitted to the House of Delegates and was unanimously carried.

Since the provisions of the above-mentioned motion could not be carried out in this election, it was moved that a nominating committee of three be appointed with instructions to bring in the names of two candidates for each office, with the understanding that additional names could be submitted from the floor. The motion was duly seconded and unanimously carried. Thereupon, the President appointed the following Nominating Committee: Dr. L. W. Allard, Dr. J. H. Garberson, and Dr. M. G. Danskin; and instructed this committee to submit names of two candidates for each of the following offices: President-elect, Vice-President, Secretary-Treasurer, Councillors—Districts No. 5, 9, 11, 12, Delegate to the A. M. A., Alternate Delegate to the A. M. A.

The committee was also requested to submit the names of ten men from whom the Governor could choose two members of the State Board of Health to fill the terms of Dr. Karsted, of Butte, and Dr. Sussex, of Havre, which will soon expire. Upon motion duly made, seconded, and unanimously carried, it was resolved that the House of Delegates should adjourn until 8:00 A. M., Tuesday, June 24, 1941.

The adjourned meeting was called to order by the President, Dr. J. I. Wernham, at 8:30 A. M., Tuesday, June 24, 1941. The House of Delegates was addressed by Dr. T. L. Hawkins, who made a plea that peace and harmony might prevail in all deliberations of the House of Delegates and in all activities of the Montana State Medical Association.

The Nominating Committee submitted the following report:

We, your Nominating Committee, have carefully gone over the names of all members eligible to office, and with a view of securing representation for all districts of the state and at the same time of selecting the best man for each office, we respectfully submit the following nominations for your consideration.

President-elect—
E. D. Hitchcock, M.D.; J. P. Ritchey, M.D.
Vice-President—
R. E. Seitz, M.D.; L. T. Sussex, M.D.
Secretary-Treasurer—
H. T. Caraway, M.D.; T. F. Walker, M.D.
Delegate to American Medical Association—
J. H. Irwin, M.D.; J. C. Shields, M.D.
Alternate Delegate—
E. M. Gans, M.D.; J. I. Wernham, M.D.
Councillor, District No. 5—
A. D. Brewer, M.D.; R. G. Sherer, M.D.
Councillor, District No. 9—
H. W. Gregg, M.D.; P. E. Kane, M.D.
Councillor, District No. 11—
S. A. Cooney, M.D.; T. L. Hawkins, M.D.
Councillor, District No. 12—
C. H. Fredrickson, M.D.; M. B. Hesdorffer, M.D.
Recommendations to the State Board of Health—
A. J. Karsted, M.D. R. C. Monahan, M.D.
A. E. Stripp, M.D. L. T. Sussex, M.D.
M. B. Hesdorffer, M.D. M. D. Winter, M.D.

S. A. Cooney, M.D. E. A. Welden, M.D.
R. F. Peterson, M.D. R. D. Knapp, M.D.

It was moved, seconded, and unanimously carried that the recommendations of the Nominating Committee as to the State Board of Health be accepted. No nominations were made from the floor. Dr. Caraway withdrew his name as a candidate for secretary. This withdrawal was accepted by the Nominating Committee. Dr. T. F. Walker was declared the unanimous choice of the House of Delegates for Secretary-Treasurer.

The ballot was then spread. The following vote was cast:

For President-elect—
E. D. Hitchcock, 16; J. P. Ritchey, 13.
For Vice-President—
L. T. Sussex, 18; R. E. Seitz, 10.
Delegate to American Medical Association—
J. H. Irwin, 19; J. C. Shields, 10.
Alternate Delegate to A. M. A.—
E. M. Gans, 15; J. I. Wernham, 13.
Councillor, District No. 5—
A. D. Brewer, 21; R. G. Sherer, 6.
Councillor, District No. 9—
H. W. Gregg, 16; P. E. Kane, 12.
Councillor, District No. 11—
S. A. Cooney, 15; T. L. Hawkins, 13.
Councillor, District No. 12—
C. H. Fredrickson, 16; M. B. Hesdorffer, 11.

The President declared the following elected to office:

President-Elect—E. D. Hitchcock, M.D.
Vice-President—L. T. Sussex, M.D.
Secretary-Treasurer—T. F. Walker, M.D.
Delegate to A. M. A.—J. H. Irwin, M.D.
Alternate Delegate to A. M. A.—E. M. Gans, M.D.
Councillor, District No. 5—A. D. Brewer, M.D.
Councillor, District No. 9—H. W. Gregg, M.D.
Councillor, District No. 11—S. A. Cooney, M.D.
Councillor, District No. 12—C. H. Fredrickson, M.D.

Dr. M. B. Hesdorffer extended an invitation from the Western Montana Medical society to the Montana State Medical Association to hold its next annual session in Missoula. It was regularly moved, duly seconded, and unanimously carried that the invitation of the Western Montana Medical society be accepted.

Dr. L. W. Brewer moved that the recommendation of the Secretary that the arrangements for exhibits be made by the State Association rather than by the local societies, be adopted. The motion was seconded by Dr. J. C. Shields and unanimously carried.

A motion was regularly made, seconded, and unanimously carried that a copy of the annual audit of the funds of the Association be distributed to each member of the Association.

After a few remarks by each of the newly elected officers, no further business coming before the House of Delegates, the meeting was adjourned.

Minutes of the Sixty-Third Annual Scientific Session of the Montana State Medical Association

The meeting was called to order by the President, Dr. J. I. Wernham, at 9:30 A. M., Tuesday, June 24, 1941, in the Palm Room of the Hotel Rainbow, in Great Falls, Montana.

Dr. F. R. Schemm, President of the Cascade County Medical society, extended a welcome from the Cascade County Medical society to the Montana State Medical Association.

The first speaker on the program was Dr. Donald King, Associate Professor of Bone and Joint Surgery, and Head of the Division of Bone and Joint Surgery, Stanford University School of Medicine, who gave a paper on "Fracture of the Spine—Its Treatment and Complications." The paper was discussed by Dr. J. C. Shields and Dr. L. W. Allard.

Dr. Charles W. Barnett, Assistant Professor of Medicine and Head of the Division of Syphilology, Stanford University School of Medicine, gave the next paper, which was on "Massive Dose Arsenotherapy in the Treatment of Syphilis." His paper was discussed by Dr. T. R. Vye and Dr. L. W. Brewer.

The meeting adjourned at 12:15.

The first speaker of the afternoon was Dr. Maurice L. Tainter, Professor of Pharmacology, Stanford University School of Medicine, who gave a paper on "Chemotherapy, Including the Sulfanilamide Group." His paper was discussed by Dr. P. L. Eneboe and Dr. P. J. Gans.

The next speaker of the afternoon was Dr. Davis A. Rytand, Assistant Professor of Medicine, Stanford University School of Medicine, who gave a paper on "The Management of Hypertension." The paper was discussed by Dr. W. G. Richards and Dr. Wayne Gordon.

The next paper was presented by Dr. Emile Holman, Professor of Surgery, Stanford University School of Medicine, which was "Carcinoma of the Lung—Its Early Symptoms and Surgical Treatment." This paper was discussed by Dr. F. I. Terrill and Dr. J. H. Bridenbaugh.

The meeting adjourned at 5:00 P. M., Tuesday, June 24, 1941.

The Sixty-Third Annual Banquet of the Association was held in the Palm Room of the Hotel Rainbow at 7:00 P. M., Tuesday, June 24, 1941. Dr. E. M. Larson acted as toastmaster. The principal speaker of the evening was Dr. M. L. Tainter.

The meeting was called to order by the President, Dr. J. I. Wernham, at 8:30 A. M., Wednesday, June 25, 1941.

The first speaker of the day was Dr. Charles W. Barnett, who gave a paper on "The Prognosis and Treatment of Late Syphilis of the Cardiovascular System." His paper was discussed by Dr. A. R. Foss and Dr. G. V. Holmes.

The next paper was presented by Dr. Davis A. Rytand, on "The Interpretation of the Newer Laboratory Methods." The paper was discussed by Dr. R. F. Peterson and Dr. R. B. Durnin.

The next speaker was Dr. Donald King, who gave a paper on "Fracture of the Upper Extremity." His paper was discussed by Dr. Gordon Anderson and Dr. E. L. Anderson.

The meeting adjourned until afternoon.

The first speaker of the afternoon was Dr. Emile Holman, who gave a paper on "Carcinoma of the Stomach—Its Early Diagnosis and Treatment by Aseptic Resection of the Stomach." This paper was discussed by Dr. E. M. Larson and Dr. A. J. Movius.

The last paper to be presented was by Dr. Maurice L. Tainter, on "Treatment of Asthma."

Dr. J. H. Irwin, Delegate to the American Medical Association, gave the following report:

The 92nd Annual Convention of the American Medical Association, held at Cleveland, Ohio, June 2 to 6, inclusive, was marked by peace and harmony. No outstanding controversial measures were presented. I think that there were fewer subjects presented for discussion than at any session I have attended and most of these did not cause any great amount of debate.

The House of Delegates came to order and was organized at 10:00 A. M., Monday, June 2. The Board of Trustees presented names to be voted on for distinguished Service Award and Dr. James Ewing of New York was nominated. The addresses by the Speaker of the House, the President and the President-elect were then given and each one is deserving of your careful reading and consideration.

From Address of President Nathan B. Van Etten, "Policies of the American Medical Association." (*Journal of the American Medical Association*, p. 2695).

"The American Medical Association has been subjected to attack by certain groups with special interests as a selfish, reactionary, antisocial and restraining influence, opposing the activities of those who desire to practice group or cooperative medicine or any new plans for the delivery of medical care; it is accused of indifference and inertia in its attitude toward public health agencies. The language of these attacks declares, in the words of a New York newspaper of Tuesday, May 6, 1941, that the American Medical Association believes 'that everything is right as rain' concerning the health of the underprivileged or the indigent or the unfortunate who cannot afford to pay for any medical care. This descent from the truth to mud slinging in order to illuminate an inspired article is interesting to you members of the House because you know that the American Medical Association, whose policies you form, desires for the American people only the best service for their best interests and their protection from any form of quackery which would exploit them when they are sick, and favors public health measures under proper auspices which can be used to keep them well and prevent infection regardless of race, creed, class, or financial competence. The same article colors its argument with arraignment of 'the old guard of organized medicine' or 'the top clique of the American Medical Association' or the 'American Medical Association Hierarchs.' This should interest you members of the House of Delegates for the reason that if there is such a thing as 'the old guard of organized medicine' you compose it. If there is such a thing as 'the top clique of the American Medical Association' you are it. If there are 'American Medical Association hierarchs' you are they.

"The old idle talk about a small group of persons in Chicago, or sometimes one person, as dictating the policy of the American Medical Association still goes on. If there are any dictators in American medicine, you are—because you alone are responsible for making our policies. Your elected officers are merely your executives.

"Why do otherwise intelligent persons and some physicians continue to believe these old stories? I have heard them for more than twenty-five years. In some manner we must be failing to present a clear and convincing picture of our organization. Can you not take the trouble to convince the people who sent you here and whose interest you serve that this is the most democratic of all democratic organizations? Can you not tell them that no one else delegated you to sit in this House and endowed you with power but the members of your county medical societies who sent you to your state societies, from which you were chosen for your high office? Can you not take the trouble to enlighten public opinion at your homes through

your local newspapers and develop a consciousness of the realities of local health needs and promote them? Can you not tell the world that the loyalties of organized medicine are even more altruistic today than they have ever been before?"

Dr. Olin West, Secretary of the American Medical Association, reported that on April 1, there were 118,441 members and since, over 1,000 additional names have been added, the largest number of members ever. The report of the Board of Trustees was quite lengthy and covered all of the activities of the A. M. A. for the past year. Any member of the A. M. A. can secure a copy of this report by writing to the Secretary and the same will be very enlightening as it shows in considerable detail the enormous amount of work carried on by our Association. I wish to call to your attention some of the outstanding features of this report.

Income and Expenditures (Summary): "Gross income from all sources for the year 1940 was \$1,876,353.80. Income received from Fellowship dues and subscriptions was \$776,202.44, exceeding income from the same source in 1939 by the sum of \$24,320.42. Income from the sale of advertising space amounted to \$969,581.25, an increase over 1939 of \$60,790.67. Interest received on investments amounted to \$80,571.91, which was \$4,367 less than in 1939. Bonds matured, sold or called during the year amounted to \$276,959.38, and bonds were purchased at cost in the sum of \$245,593.75. The face value of defaulted bonds amounts to \$48,400, the same as in 1931; the accumulated unpaid interest is now \$5,530.10. The cost of paper used in the publication of the *Journal* was approximately \$1,500 greater in 1940 than in 1939. Expenditures on account of the various councils, bureaus and departments of the Association, including the newly established Committee on Medical Preparedness, were \$482,510.35 as compared with \$484,052.06 in 1939. Miscellaneous expenses, including fees for legal services and investigations and losses involved in sundry publications, amounted to \$194,507.82. The number of persons employed by the Association at the time of preparation of this report was 636. Net income for the year as shown in the Report of the Auditor was \$187,768.30, of which \$80,571.91 represented interest on investments."

Under *Press Relations* the following portion is quoted—(page 45): "During 1940, there was developed among the various mediums of public information, under the supervision of the Editor of the *Journal*, a wider acceptance of the American Medical Association as a source of information regarding all phases of medicine than ever before in the history of the Association. In 1940, more than 78,000 newspaper stories based on articles in the *Journal of the American Medical Association* and in *Hygeia* appeared in the daily press of the United States. This total does not include feature stories and editorials in daily newspapers pertaining to information published by the Association, the number of which is constantly increasing. These newspaper stories are furnished the press through the *American Medical Association News*, a weekly publication containing abstracts of articles appearing in the various periodicals of the Association. The mailing list of this publication includes 325 daily newspapers, 77 news services, radio stations, and miscellaneous publications, 40 local and state health departments, 51 non-governmental health and tuberculosis associations, 82 county and local medical societies, 87 national medical organizations, 28 science writers, 60 pharmaceutical associations and manufacturing companies, 45 industrial organizations and 17 educational institutions."

A new publication by the American Medical Association, known as *War Medicine* was begun in January, 1941. This periodical represents a notable contribution to national defense. (Library—quote from page 51): "The Library of the American Medical Association maintains a package library service, a periodical lending service and an employee's lending library, records all books received and reviewed for the *Journal*, provides a general reference service, prepares and edits the index for the *Journal* and prepares material for the *Quarterly Cumulative Index Medicus*."

"In 1940, 3,052 package libraries were distributed in response to requests coming from every state, 13,265 periodicals were

lent, approximately 5,500 miscellaneous reference questions were answered, 1,048 visitors to the Library requesting service were accommodated and 5,028 books were circulated from the employees' lending library. A second edition of the booklet *Subject Headings and Cross References to the Quarterly Cumulative Index Medicus*, prepared in the Library, was published."

I wish again to call to your attention that any member of the American Medical Association may secure literature from the library of the A. M. A. on any medical subject he may wish, for the purpose of writing a paper, a book, or simply for his own information.

The Council on Pharmacy and Chemistry is one of the important departments of the American Medical Association, carefully investigating and reporting on all new remedies and procedures, thus enabling doctors to keep abreast of the advances in therapeutics. The Council reports that the series of articles on Endocrines now appearing in the *Journal* will be published in book form and may be secured as soon as the series is completed. I would like to call particularly to the attention of pathologists and hospital superintendents the part of the report of the Council on Medical Education and Hospitals on essentials of acceptable school for clinical and laboratory technicians given in full in the *Journal of the American Medical Association* of June 14, page 2698.

At this point in the proceedings, Dr. T. C. Routley, official representative of the Canadian Medical Association, was introduced and addressed the House, in conclusion extending a cordial invitation to attend the meeting of the Canadian Medical Association during the last week in June.

A number of resolutions from State and County Societies were introduced, the one from Michigan being of particular interest to most of us. I will not read the resolution as presented (you can read it in the June 14th *Journal of the American Medical Association*) but will state that it had to do with a section on General Practice. The House finally decided to have a trial section at the next American Medical Association meeting in an attempt to determine interest and value of same. A resolution requesting appointment of a committee to survey the relationship of medicine and law with special reference to office of County Coroner was referred to Board of Trustees and Judicial Council for consideration.

The exhibits, both scientific and commercial, were, as usual, outstanding both from an educational and practical standpoint. As I have remarked before, one could spend the whole five days attending these exhibits and still wish for more time.

Fred Rankin of Lexington, Kentucky, was elected President-elect. St. Louis was chosen for the 1944 meeting, the 1942 meeting will be at Atlantic City and the 1943 meeting in San Francisco. The meeting next year will be in the nature of a Pan-American meeting and all countries of both Americas will be invited to attend and participate.

Signed: J. H. IRWIN, M.D.,
Montana Delegate.

The Committee on Resolutions presented the following resolutions, which were unanimously adopted:

Whereas, The Cascade County Medical society has made this meeting possible through the untiring efforts of its full membership,

Be It Resolved, that the Cascade County Medical society be extended our sincere appreciation for this most successful annual meeting.

Be It Further Resolved, that each individual committee of the society receive our heartiest congratulations for the success which has been attained through the medium of long and arduous labors.

Whereas, the cooperation existing between the host society and the Program Committee of the Montana State Medical Association is a real factor in the success of such a meeting,

Be It Resolved, that our thanks be extended to this Program Committee, especially to Dr. T. L. Hawkins, who, as chairman of this committee, has labored hard for the success of this meeting.

Whereas, the Scientific Session is the most important part of our annual meeting,

Be It Resolved, that our sincere thanks be extended to Dr. Emile Holman, Dr. Donald King, Dr. Charles W. Barnett, Dr. Davis A. Rytand, and Dr. Maurice L. Tainter, who have so graciously given of their time and scholarship to the success of the scientific part of this meeting.

Whereas, the commercial exhibitors have contributed largely to the financial success of this meeting and have provided exhibits of great practical value to our membership,

Be It Resolved, that our thanks be extended to these commercial exhibitors.

Whereas, various business establishments in Great Falls have extended to us their hospitality,

Be It Resolved, that our appreciation be expressed to the Rainbow Hotel for the excellent service rendered to us; to the Anaconda Copper Mining Company and the Montana Power Company, for the picnic and evening entertainment given to the Doctors and wives at the Big Falls; to the Press for their generous publicity given to this meeting.

Whereas, the officers of the Montana State Medical Association are always in large part responsible for the success of our meetings,

Be It Resolved, that the officers of the Montana State Medical Association be extended our thanks for their untiring efforts during the past year, and

Be It Further Resolved, that our sincere appreciation be extended especially to Dr. Thos. F. Walker, who as Secretary-Treasurer of the Montana State Medical Association has given liberally of his time and ability during the past few trying months.

Whereas, the new officers of the Montana State Medical Association assume their duties at this time,

Be It Resolved, that our welcome be extended to W. E. Long, M.D., who assumes office as President of our Association, and that the House of Delegates pledge to him its hearty cooperation, and also its wishes for a most successful tenure of office.

H. T. CARAWAY, M.D., *Chairman.*

M. G. DANSKIN, M.D.

P. E. KANE, M.D.

The following report of the Necrology Committee was adopted, upon motion duly made, seconded, and unanimously carried.

During the past year, we have lost through death, six of our most beloved friends and fellow members. It is therefore fitting that we pause and pay tribute to the memory of Dr. H. D. Browning, Dr. Laurence Stevens, Dr. Chas. Coulter, Dr. M. D. Hoyt, Dr. F. W. Briggs, and Dr. A. M. Macaulay.

There being no further business, the meeting was adjourned.

MONTANA STATE MEDICAL ASSOCIATION DISTRICT SOCIETY ROSTER--1941

CASCADE COUNTY MEDICAL SOCIETY

Dr. B. E. Lord	Dr. E. D. Hitchcock
Dr. J. P. Greaves	Dr. L. L. Howard
Dr. F. D. Hurd	Dr. A. C. Johnson
Dr. H. J. McGregor	Dr. E. M. Larson
Dr. J. H. McGregor	Dr. F. L. McPhail
Dr. R. J. McGregor	Dr. E. M. Porter
Dr. J. R. Vasko	Dr. R. B. Richardson
Dr. F. L. Andrews	Dr. F. R. Schemm
Dr. C. V. Templeton	Dr. A. L. Weisgerber
Dr. W. T. Williams	Dr. C. F. Little
Dr. C. J. Bresee	Dr. H. V. Gibson
Dr. H. W. Fuller	Dr. L. R. McBurney
Dr. C. E. Blankenhorn	Dr. F. P. Silvernale
Dr. H. W. Bateman	Dr. F. E. Keenan
Dr. L. L. Mayland	Dr. I. A. Allred
Dr. J. C. MacGregor	Dr. P. E. Logan
Dr. T. F. Walker	Dr. J. H. Irwin
Dr. D. E. Walker	Dr. F. K. Waniata
Dr. Earle Strain	Dr. G. W. Setzer
Dr. R. C. Davis	Dr. R. J. Holzberger
Dr. F. H. Craig	Dr. C. E. Nagel
Dr. R. B. Durnin	Dr. C. E. Anderson
Dr. A. L. Gleason	Dr. L. S. Cray
Dr. C. M. Hall	Dr. C. H. Peterson
Dr. E. L. Hall	Dr. Rose Russell

FERGUS COUNTY MEDICAL SOCIETY

Dr. F. F. Attix	Dr. R. G. Johnson
Dr. E. A. Welden	Dr. E. M. Gans
Dr. J. H. Herring	Dr. E. W. Gans
Dr. E. S. Porter	Dr. P. J. Gans
Dr. Raymond Eck	Dr. J. L. Alexander
Dr. J. R. Soltero	(life member)
Dr. Claude Mears	Dr. A. W. Deal
Dr. C. W. Wilder	(life member)
Dr. C. C. Wallin	Dr. J. F. Willess
Dr. Hazel Freed	

FLATHEAD COUNTY MEDICAL SOCIETY

Dr. Albert Brassett	Dr. F. B. Ross
Dr. L. G. Griffis	Dr. C. J. Martin
Dr. J. A. Lamb	Dr. A. A. Dodge
Dr. R. L. Towne	Dr. M. Borkon
Dr. H. D. Huggins	Dr. A. T. Monroe
Dr. W. Q. Conway	Dr. C. A. Clark
Dr. E. P. Cockrell	Dr. W. W. Taylor
Dr. T. B. Moore, Jr.	Dr. A. T. Lees
Dr. J. M. Cairns	Dr. W. L. Kell
Dr. G. B. Wright	Dr. W. M. Bottorf
Dr. M. O. Burns	Dr. J. B. Simons
Dr. J. R. Delaney	Dr. M. D. Holcomb
Dr. R. M. Stewart	

GALLATIN COUNTY MEDICAL SOCIETY

Dr. W. S. Bole	Dr. R. R. Sigler
Dr. A. D. Brewer	Dr. C. S. Smith
Dr. P. L. Eneboe	Dr. R. G. Sherer
Dr. E. R. Grigg	Dr. C. E. Whitehead
Dr. B. J. Heetderks	Dr. R. A. Williams
Dr. L. L. Maillat	Dr. R. J. Keeton
Dr. J. H. Phillips	Dr. E. J. Kearns
Dr. F. I. Sabo	Dr. J. T. Bradbury
Dr. C. C. Seerley	(honorary)
Dr. R. C. Seitz	

HILL COUNTY MEDICAL SOCIETY

Dr. F. W. Aubin	Dr. W. L. Forster
Dr. D. J. Almas	Dr. W. F. Hamilton
Dr. R. A. Benke	Dr. W. A. Lacey
Dr. E. A. Doles	Dr. L. T. Sussex
Dr. C. S. Houtz	Dr. D. S. MacKenzie, Jr.
Dr. A. S. Hoon	Dr. D. S. MacKenzie, Sr.
Dr. G. A. Jestrab	

LEWIS AND CLARK COUNTY MEDICAL SOCIETY

Dr. W. M. Copenhaver	Dr. C. J. Jump
Dr. W. F. Cashmore	Dr. Marjorie K. Smith
Dr. O. G. Klein	Dr. J. J. McCabe
Dr. R. W. Morris	Dr. S. A. Cooney
Dr. E. H. Lindstrom	Dr. E. L. Gallivan
Dr. T. L. Hawkins	Dr. D. T. Berg
Dr. L. F. Hall	Dr. J. M. Bierman
Dr. B. K. Kilbourne	Dr. J. G. Thompson
Dr. Edythe Hershey	Dr. G. H. Barbour
Dr. L. M. Farnier	(life member)
Dr. J. M. Flinn	Dr. D. N. Monserrate
Dr. B. C. Shearer	

MADISON COUNTY MEDICAL SOCIETY

Dr. D. F. Clancy	Dr. L. R. Packard
Dr. R. H. Dyer	Dr. W. J. Burns
Dr. F. B. Farnsworth	

MOUNT POWELL MEDICAL SOCIETY

Dr. L. G. Dunlap	Dr. T. J. Kargacin
Dr. W. E. Long	Dr. E. Lieurance
Dr. M. R. Snodgrass	Dr. A. C. Knight
Dr. B. L. Pampel	Dr. Leroy Bolton
Dr. Gladys Holmes	Dr. B. D. Mitchell
Dr. B. A. Place	Dr. D. E. Downey
Dr. F. I. Terrill	Dr. R. W. Getty
Dr. W. A. Beasley	Dr. Leo Crowley
Dr. F. L. Unmack	Dr. J. J. Malee
Dr. G. A. Anderson	Dr. K. A. Tyler
Dr. J. L. O'Rourke	Dr. A. J. Willits

MUSSELSHELL COUNTY MEDICAL SOCIETY

Dr. G. A. Lewis	Dr. R. E. Brogan
Dr. R. T. O'Neill	Dr. E. R. Foutz
Dr. A. A. Bennett	

NORTH CENTRAL MONTANA MEDICAL SOCIETY

Dr. W. F. Paterson	Dr. H. F. Schraeder
Dr. O. A. Bosshardt	Dr. W. A. Meadows
Dr. W. L. DuBois	Dr. P. O. Neadal
Dr. J. M. Spatz	Dr. N. A. Olsen
Dr. H. W. Power	Dr. W. C. Robinson

NORTHEASTERN MONTANA MEDICAL SOCIETY

Dr. O. G. Benson	Dr. R. Peterson
Dr. H. B. Cloud	Dr. R. E. Ryde
Dr. T. L. Cockrell	Dr. A. N. Smith
Dr. R. D. Knapp	Dr. J. C. Storkan
Dr. F. M. Knierim	Dr. D. B. Studer
Dr. L. T. Krogstad	Dr. E. J. Mittleman
Dr. C. B. Larson	Dr. F. L. Darland
Dr. C. J. Munch	Dr. A. J. Kreft

PARK-SWEETGRASS COUNTY MEDICAL SOCIETY

Dr. L. W. Baskett	Dr. A. M. Leuick
Dr. D. Claiborn	Dr. J. A. Pearson
Dr. W. F. Cogswell	Dr. G. A. Townsend
Dr. P. L. Green	Dr. R. A. Walker
Dr. W. H. Harris	Dr. G. A. Windsor
Dr. S. E. Leard	

LAKE COUNTY MEDICAL SOCIETY

Dr. J. L. Richards	Dr. E. G. Lipow
Dr. H. M. Teel	Dr. J. M. Brooke
Dr. J. Diamon	Dr. G. E. Armour
Dr. J. L. Koehler	Dr. W. G. Tanglin
Dr. T. A. Mathews	

SILVER BOW COUNTY MEDICAL SOCIETY

Dr. R. A. Kroeze	Dr. J. Thorkelson
Dr. S. E. Swartz	Dr. C. W. Pemberton
Dr. L. W. Smith	Dr. D. L. Gillespie
Dr. S. V. Wilking	Dr. P. E. Kane
Dr. J. B. Frisbee	Dr. E. S. McMahon
Dr. R. F. Peterson	Dr. N. J. O'Keith
Dr. Harold Simons	Dr. H. A. Stanchfield
Dr. Frank Williams	Dr. F. M. Poindexter
Dr. C. R. Canty	Dr. J. T. Lhotka
Dr. C. B. Rodes	Dr. R. N. Morgan
Dr. H. H. James	Dr. T. W. Saam
Dr. D. A. Atkins	Dr. G. L. Rutledge
Dr. G. T. MacPherson	Dr. T. J. B. Shanley
Dr. J. C. Lapierre	Dr. J. E. Garvey
Dr. G. A. Carmichael	Dr. J. K. Colman
Dr. J. R. E. Sievers	Dr. John Floyd
Dr. A. R. Sievers	Dr. P. T. Spurck
Dr. H. C. Joesting	Dr. T. F. Bush
Dr. J. L. Shields	Dr. Harold Gregg
Dr. H. L. Casebeer	Dr. Harold Schwartz
Dr. R. J. Hill	Dr. R. C. Monahan
Dr. Carl Horst	Dr. R. C. Kane
Dr. V. O. Ungherini	Dr. S. S. Sternberg
Dr. M. C. Smetters	Dr. W. H. Stephan
Dr. Alfred Karstad	Dr. G. M. Donich
Dr. S. F. Saam	Dr. J. J. Kane
Dr. D. E. Hale	Dr. J. L. Mondloch
Dr. C. McGill	Dr. J. H. Mahee

SOUTHEASTERN MONTANA MEDICAL SOCIETY

Dr. J. J. Bridenstein	Dr. B. R. Tarbox
Dr. S. B. Lindberg	Dr. S. A. Olson
Dr. E. H. Rowen	Dr. M. A. Shillington
Dr. J. H. Garberson	Dr. R. G. Lemon
Dr. Elna M. Howard	Dr. M. D. Winter
Dr. R. D. Benson	Dr. H. J. Huene
Dr. C. M. Lund	Dr. J. V. Neville
Dr. J. W. Craig	Dr. H. Denman
Dr. S. E. Pratt	Dr. B. C. Farrand
Dr. E. F. Noonan	Dr. B. B. Sandy
Dr. M. G. Danskin	Dr. J. H. Hunt
Dr. J. R. Thompson	Dr. R. D. Harper
Dr. J. S. Beagle	Dr. R. A. Morrill
Dr. W. H. Blackmore	Dr. R. R. Randall
Dr. A. R. Varco	

YELLOWSTONE VALLEY MEDICAL SOCIETY

Dr. E. M. Adams	Dr. L. H. Kronmiller
Dr. L. W. Allard	Dr. L. N. Labbitt
Dr. M. O. Anderson	Dr. D. D. Leeper
Dr. C. C. Beltzer	Dr. L. Levitt
Dr. A. W. Blackstone	Dr. D. J. MacDonald
Dr. J. H. Bridenbaugh	Dr. Harold McIntyre
Dr. B. H. Brunkow	Dr. R. V. Morledge
Dr. M. S. Burdick	Dr. J. D. Morrison
Dr. H. T. Caraway	Dr. W. R. Morrison
Dr. R. R. Chapple	Dr. A. J. Movius
Dr. A. E. Clark	Dr. C. H. Nelson
Dr. H. H. Culbertson	Dr. J. V. Neville
Dr. R. W. Currie	Dr. J. C. Powers
Dr. J. J. DeMers	Dr. O. C. Rathman
Dr. H. O. Drew	Dr. W. G. Richards
Dr. Frank Dunkle	Dr. G. M. Russell
Dr. E. M. Farr	Dr. J. W. Schubert
Dr. V. D. Ferree	Dr. J. A. Shaw
Dr. M. L. Fisher	Dr. W. P. Smith
Dr. Wayne Gordon	Dr. L. Stevens
Dr. J. H. Graham	Dr. A. E. Stripp
Dr. P. S. Griffin	Dr. T. R. Vye
Dr. E. A. Hagemann	Dr. W. P. Weedman
Dr. E. C. Hall	Dr. S. J. Werner
Dr. Fred Hammernik	Dr. J. I. Wernham
Dr. A. L. Hammerel	Dr. L. G. Russell
Dr. R. J. Hanley	Dr. G. A. McHeffy
Dr. D. E. Hodges	Dr. S. M. Souders
Dr. J. E. Hynes	

WESTERN MONTANA MEDICAL SOCIETY

Dr. G. R. Fattic	Dr. C. H. Fredrickson
Dr. A. W. Hiemstra	Dr. A. W. Rew
Dr. L. W. Brewer	Dr. G. S. Frogner
Dr. J. A. Duffalo	Dr. P. G. Noble
Dr. A. R. Foss	Dr. J. K. Cummings
Dr. E. K. George	Dr. R. W. Keys
Dr. H. J. Hall	Dr. W. T. Thornton
Dr. W. F. Morrison	Dr. C. R. Thornton
Dr. M. B. Hesdorffer	Dr. Herbert Hayward
Dr. F. D. Pease	Dr. C. L. Bourdeau
Dr. A. T. Haas	Dr. E. J. Bourdeau
Dr. P. S. Murphy	Dr. J. J. Flynn
Dr. G. G. Sale	Dr. J. M. Graybeal
Dr. J. M. Nelson	Dr. J. L. Holmes
Dr. W. J. Doyle	Dr. R. C. Kirkwood
Dr. W. E. Marshall	Dr. H. H. Koessler
Dr. R. E. Wirth	Dr. W. N. McPhail
Dr. J. P. Ritchey	Dr. L. T. Martin
Dr. P. S. Renning	Dr. H. C. Shepherd
Dr. C. C. Tefft	Dr. G. F. Turman
Dr. D. A. Gordon	Dr. E. J. French
Dr. C. F. Honeycutt	(life member)
Dr. A. R. Kintner	Dr. T. H. Hanbidge
Dr. J. F. S. Marshall	(life member)
Dr. S. N. Preston	Dr. W. N. King
Dr. S. M. Trenouth	(life member)
Dr. L. R. Alderson	Dr. J. P. Ohlmach
Dr. F. H. Lowe	

CHOUTEAU COUNTY MEDICAL SOCIETY

Dr. D. J. Cooper	Dr. E. L. Anderson
Dr. C. F. Bassow	Dr. Gaylord Worstell

BLAINE COUNTY MEDICAL SOCIETY

Dr. W. A. McCannell	Dr. W. N. Deatherage
Dr. D. J. Almas	

ALPHABETICAL ROSTER
Montana State Medical Association--1941

Adams, E. M. Red Lodge	Baskett, L. W. Big Timber	Blankenhorn, C. E. Great Falls
Alderson, T. R. Missoula	Bassow, C. F. Fort Benton	Bole, W. S. Bozeman
Alexander, J. Winnett	Bateman, H. W. Chouteau	Bolton, L. R. Deer Lodge
Allard, L. W. Billings	Beagle, J. S. Sidney	Borkon, M. Whitefish
Allred, I. A. Great Falls	Beasley, W. A. Galen	Bortorf, W. M. Kalispell
Almas, D. J. Chinook	Beltzer, C. E. Washoe	Bosshardt, O. A. Conrad
Anderson, C. E. Great Falls	Benke, R. A. Chester	Bourdeau, C. L. Missoula
Anderson, E. L. Fort Benton	Bennett, A. A. Roundup	Bourdeau, E. J. Missoula
Anderson, G. A. Deer Lodge	Benson, O. G. Plentywood	Bradbury, J. T. Willow Creek
Anderson, M. O. Hardin	Benson, R. D. Sidney	Brassett, A. J. Kalispell
Andrews, F. L. Great Falls	Berg, D. T. Helena	Brese, C. J. Great Falls
Armour, G. E. St. Ignatious	Bierman, J. M. Washington, D. C.	Brewer, A. D. Bozeman
Atkins, D. A. Butte	Children's Bureau, U. S. Dept.	Brewer, L. W. Missoula
Artix, F. F. Lewistown	of Labor	Bridenbaugh, J. H. Billings
Aubin, F. W. Havre	Blackstone, A. V. Columbus	Bridenstine, I. J. Terry
Barbour, G. H. Helena	Blakemore, W. H. Baker	Brogan, R. E. Roundup

Brooke, J. M.	Ronan	Gallivan, E. L.	Helena	Kell, W. L.	Columbia Falls
Brunkow, B. H.	Billings	Garvey, J. E.	Butte	Keys, R. W.	Missoula
Burdick, M. S.	Crow Agency	Gans, E. M.	Harlowton	Kilbourne, B. K.	Helena
Burns, M. O.	Kalispell	Gans, E. W.	Harlowton	King, W. N.	Missoula
Burns, W. J.	Sheridan	Gans, P. J.	Lewistown	Kintner, A. R.	Missoula
Bush, T. F.	Butte	Garberson, J. H.	Miles City	Klein, O. G.	Helena
Cairns, J. M.	Libby	George, E. K.	Missoula	Knapp, R. D.	Wolf Point
Canty, C. R.	Butte	Getty, R. W.	Galen	Knierim, F. M.	Glasgow
Caraway, H. T.	Billings	Gibson, H. V.	Great Falls	Knight, A. C.	Philipsburg
Carmichael, G. A.	Butte	Gillespie, D. L.	Butte	Koessler, H. H.	Seeley Lake
Casebeer, H. L.	Butte	Gleason, A. L.	Great Falls	Koehler, J. L.	Polson
Cashmore, W. F.	Helena	Gordon, D. A.	Hamilton	Kreft, A. J.	Fort Peck
Chapple, R. R.	Billings	Graham, J. H.	Billings	Kroeze, R.	Butte
Claiborn, D. R.	Big Timber	Graybeal, J. M.	Missoula	Krogstad, L. T.	Wolf Point
Clark, A. E.	Billings	Greaves, J. P.	Great Falls	Kronmiller, L. H.	Billings
Clark, C. A.	Eureka	Greene, P. L.	Livingston	Labbitt, L. H.	Hardin
Cloud, H. B.	Wolf Point	Gregg, H. W.	Butte	Lacey, W. A.	Havre
Cockrell, E. P.	Kalispell	Griffin, P. E.	Billings	Lamb, J. A.	Kalispell
Cockrell, T. L.	Hinsdale	Griffis, L. G.	Kalispell	Lapierre, J. G.	Butte
Clancy, D. F.	Ennis	Grigg, E. R.	Bozeman	Larson, C. B.	Glasgow
Cogswell, W. F.	Helena	Haas, A. T.	Missoula	Larson, E. M.	Great Falls
Colman, J. K.	Butte	Hagmann, E. A.	Billings	Leard, S. E.	Livingston
Conway, W. Q.	Kalispell	Hale, D. E.	Butte	Levitt, L.	Worden
Cooney, S. A.	Helena	Hall, C. M.	Great Falls	Leeper, D. D.	Laurel
Cooper, D. J.	Big Sandy	Hall, E. L.	Great Falls	Lees, A. T.	Whitefish
Copenhaver, W. M.	Helena	Hall, E. C.	Laurel	Lemon, R. G.	Glendive
Craig, J. K.	Circle	Hall, H. J.	Missoula	Leuick, A. M.	Livingston
Craig, F. H.	Great Falls	Hall, L. F.	Helena	Lewis, G. A.	Roundup
Crary, L. S.	Fairfield	Hamernick, F.	Crow Agency	Lhotka, J. F.	Butte
Crowley, L. G.	Warm Springs	Hamilton, W. F.	Havre	Lieurance, E.	Warm Springs
Culbertson, H. H.	Billings	Hammerel, A. L.	Billings	Lindeberg, S. B.	Miles City
Cummings, J. K.	Missoula	Hanbidge, T. H.	Darby	Lindstrom, E. H.	Helena
Currie, R. W.	Billings	Hanley, R. J.	Billings	Lipow, E. G.	Ronan
Danskin, M. G.	Glendive	Harper, R. D.	Sidney	Little, C. F.	Great Falls
Darland, F. L.	Froid	Harris, W. E.	Livingston	Logan, P. E.	Great Falls
Davis, R. C.	Great Falls	Hawkins, T. L.	Helena	Long, W. E.	Anaconda
Deal, A. W.	Lewistown	Hayward, H. C.	Hamilton	Lord, B. E.	Great Falls
Delaney, J. R.	Kalispell	Heetderks, B. J.	Bozeman	Lowe, F. H.	Missoula
DeMers, J. J.	Huntley	Herring, J. H.	Lewistown	Lund, C.	Fairview
Denman, H.	Baker	Hershey, E.	Helena	MacDonald, D. J.	Billings
Deatherage, W. N.	Harlem	Hesdorffer, M. B.	Missoula	MacGregor, J. C.	Great Falls
Diamond, J.	Polson	Hiemstra, W.	Minneapolis	MacKenzie, D. S., Jr.	Havre
Dodge, A. A.	Kalispell	Hill, R. J.	Whitehall	MacKenzie, D. S., Sr.	Havre
Doles, E. A.	Havre	Hitchcock, E. D.	Great Falls	MacPherson, G. T.	Butte
Donich, G. M.	Butte	Hodges, D. E.	Billings	Maillet, L. L.	Three Forks
Doyle, W. J.	Superior	Holcomb, M. D.	Whitefish	Malee, F. H.	Butte
Downey, D. E.	Warm Springs	Holmes, G. V.	Warm Springs	Malee, J. J.	Anaconda
Drew, H. O.	Billings	Holmes, J. T.	Missoula	Marshall, J. F. S.	Missoula
DuBois, W. L.	Conrad	Holzberger, R. J.	Great Falls	Marshall, W. E.	Missoula
Dunkle, F.	Billings	Honeycutt, C. F.	Missoula	Martin, C. J.	Whitefish
Dunlap, L. G.	Anaconda	Hoon, A. S.	Chinook	Martin, L. P.	Missoula
Durnin, R. B.	Great Falls	Horst, C. H.	Butte	Mathews, T. A.	St. Ignatious
Duffalo, J. A.	Missoula	Houtz, C. S.	Havre	Mayland, L. L.	Great Falls
Dyer, R. H.	Sheridan	Howard, E. M.	Miles City	McBurney, L. R.	Great Falls
Eck, Raymond	Lewistown	Howard, L. L.	Great Falls	McCabe, J. J.	Helena
Eneboe, P. L.	Bozeman	Huene, H. J.	Forsyth	McCannel, W. A.	Harlem
Farner, L. M.	Helena	Huggins, H. D.	Kalispell	McGill, C.	Butte
Farnsworth, R. B.	Virginia City	Hunt, J. H.	Glendive	McGregor, H. J.	Great Falls
Farr, E. M.	Billings	Hurd, F. D.	Great Falls	McGregor, J. F.	Great Falls
Farrand, B. C.	Jordan	Hynes, J. E.	Billings	McGregor, R. J.	Great Falls
Fattic, G. R.	Hot Springs	Irwin, J. H.	Great Falls	McHefly, G. A.	Billings
Ferree, V. D.	Bridger	James, H. H.	Butte	McIntyre, H. E.	Billings
Fisher, M. L.	Hardin	Jestrab, G. A.	Havre	McMahon, E. S.	Butte
Flinn, J. M.	Helena	Johnson, A. C.	Great Falls	McPhail, F. L.	Great Falls
Floyd, J. S.	Butte	Johnson, R. G.	Harlowton	McPhail, W. N.	Missoula
Flynn, J. J.	Missoula	Joesting, H. C.	Butte	Meadows, W. A.	Sunburst
Forster, W. L.	Havre	Jump, C. F.	Helena	Mears, Claude	Lewistown
Foss, A. R.	Missoula	Kane, J. J.	Butte	Mitchell, B. D.	Deer Lodge
Fouts, E. R.	Ryegate	Kane, P. E.	Butte	Mittleman, E. J.	Wolf Point
Fredrickson, C. H.	Missoula	Kane, R. C.	Butte	Monahan, R. C.	Butte
Freed, H.	Stanford	Kargacin, T. J.	Anaconda	Mondloch, J. L.	Butte
French, E. J.	Ronan	Karsted, A. J.	Butte	Monseratte, D. N.	Helena
Frisbee, J. B.	Butte	Kearns, E. J.	Bozeman	Moore, T. B., Jr.	Kalispell
Frogner, G. S.	Thompson Falls	Keenan, F. E.	Great Falls	Morgan, R. N.	Butte
Fuller, H. W.	Great Falls	Keeton, R. G.	Helena	Morledge, R. V.	Billings

Morrill, R. A.	Sidney	Rodes, C. B.	Butte	Strain, E.	Great Falls
Morris, R. W.	Helena	Ross, F. B.	Kalispell	Studer, D. B.	Fort Peck
Morrison, J. D.	Billings	Routledge, G. L.	Dillon	Stripp, A. E.	Billings
Morrison, W. F.	Missoula	Rowen, E. H.	Miles City	Sussex, L. T.	Havre
Morrison, W. R.	Billings	Russell, G. M.	Billings	Tanglin, W. G.	Polson
Movius, A. J.	Billings	Russell, L. G.	Billings	Tarbox, B. R.	Forsyth
Munch, C. J.	Culbertson	Russell, R.	Fort Shaw	Taylor, W. W.	Whitefish
Munro, A. T.	Kalispell	Ryde, R. E.	Glasgow	Teel, H. M.	Polson
Murphy, E. S.	Missoula			Tefft, C. C.	Hamilton
Nagel, C. E.	Great Falls	Saam, S. F.	Butte	Templeton, C. V.	Great Falls
Nelson, C. H.	Billings	Saam, T. W.	Butte	Terrill, F. I.	Galen
Nelson, J. M.	Stevensville	Sabo, F. I.	Bozeman	Thompson, J. G.	Helena
Neraal, P. O.	Cut Bank	Sale, G. G.	Missoula	Thompson, J. R.	Miles City
Neville, J. V.	Forsyth	Sandy, B. B.	Ekalaka	Thorkelson, J.	Butte
Noble, P. G.	Polson	Schemm, F. R.	Great Falls	Thornton, C. R.	Missoula
Noonan, E. F.	Wibaux	Scherer, R. G.	Bozeman	Thornton, W. T.	Missoula
Ohlmacher, J. P.	Missoula	Schraeder, H. F.	Browning	Towne, R. L.	Kalispell
O'Keefe, N. J.	Butte	Schubert, J. W.	Hardin	Townsend, G. A.	Livingston
Olsen, N. A.	Cut Bank	Schwartz, H.	Butte	Trenouth, S. M.	Missoula
Olson, S. A.	Glendive	Schwartz, S. E.	Butte	Turman, C. F.	Missoula
O'Neill, R. T.	Roundup	Seerley, C. C.	Bozeman	Tyler, K. A.	Boulder
O'Rourke, J. L.	Anaconda	Seigler, R. E.	Bozeman		
Packard, L. R.	Whitehall	Seitz, R. E.	Bozeman	Ungherini, V. O.	Butte
Pampel, B. L.	Warm Springs	Seivers, A. R.	Butte	Unmack, F. L.	Deer Lodge
Paterson, W. F.	Conrad	Seivers, R. E.	Butte	Varco, A. R.	Miles City
Pease, F. D.	Missoula	Setzer, G. W.	Malta	Vasko, J. R.	Great Falls
Pearson, J. A.	Livingston	Shanley, T. J. B.	Butte	Vye, T. R.	Laurel
Pemberton, C. W.	Butte	Shaw, J. A.	Billings		
Peterson, C. H.	Great Falls	Shearer, B. C.	Helena	Walker, D. V. H.	Great Falls
Peterson, R.	Glasgow	Shephard, H. C.	Missoula	Walker, R. E.	Livingston
Peterson, R. F.	Butte	Shields, J. C.	Butte	Walker, T. F.	Great Falls
Phillips, J. H.	Bozeman	Shillington, M. A.	Glendive	Wallin, C. C.	Lewistown
Place, B. A.	Warm Springs	Silvernale, F. P.	Great Falls	Waniata, F. K.	Great Falls
Poindexter, F. M.	Dillon	Simons, H.	Butte	Weedman, W. F.	Billings
Porter, E. M.	Great Falls	Simons, J. B.	Whitefish	Weisgerber, A. L.	Great Falls
Porter, E. S.	Lewistown	Smetters, M.	Butte	Welden, E. A.	Lewistown
Powell, C. D.	Valier	Smith, A. N.	Glasgow	Werner, S. L.	Billings
Power, H. W.	Conrad	Smith, C. S.	Bozeman	Wernham, J. I.	Billings
Powers, J. C.	Billings	Smith, L. W.	Butte	Whitehead, C. E.	Bozeman
Pratt, S. C.	Miles City	Smith, M. K.	Helena	Wilder, C. W.	Lewistown
Preston, S. M.	Missoula	Smith, W. P.	Columbus	Wilking, S. V.	Butte
Randall, R. R.	Miles City	Snodgrass, M. R.	Anaconda	Willers, H. F.	Lewistown
Rathman, O. C.	Billings	Souders, S. M.	Red Lodge	Williams, F. J.	Butte
Rennick, P. S.	Stevensville	Soltero, J. R.	Lewistown	Williams, R. A.	Manhattan
Rew, A. W.	Thompson Falls	Spatz, J. M.	Cut Bank	Williams, W. T.	Malta
Richards, J. L.	Polson	Spurck, P. T.	Butte	Willits, A. J.	Anaconda
Richards, W. G.	Billings	Stanchfield, H.	Dillon	Windsor, G. A.	Livingston
Richardson, R. B.	Great Falls	Steinberg, S. S.	Butte	Winter, M. D.	Miles City
Ritchey, J. P.	Missoula	Stephan, W. H.	Dillon	Wirth, R. E.	Missoula
		Stewart, R. M.	Whitefish	Worstell, G.	Big Sandy
		Storkan, J. C.	Plentywood	Wright, G. B.	Kalispell

Presidential Address*

J. I. Wernham, M.D.

Billings, Montana

MR. TOASTMASTER, Guests and Members of the Montana State Medical Association: It is always a pleasant occasion when the medical profession of Montana assembles for its annual meeting; it is particularly an enjoyable time when the members gather around the banquet table. This is a time when we can forget our cares of patients and get away for a few days of recreation, education and social contact. Here we meet our fellow members, many of whom we see but once a year.

This past year has been an unusually active and strenuous year due to our own activities and partly to influences beyond our control. The present situation in the world affairs affects every one of us. It tends to make a spirit of unrest and anxiety. The medical profession has always been a patriotic body. Although the American Medical Association for the past three years has been threatened by governmental political control, or state medicine, when the time comes for defending our democracy the medical profession unites with the administration and takes a leading position in offering the services of an organized profession to the government. A system has been set up by the American Medical Association for ascertaining the availability of the doctors for the service. This system is unique, and was created from questionnaires sent to over 175,000 American physicians. Nearly 150,000 of these questionnaires have been answered and returned, and from these the status of each physician can be easily and quickly obtained.

The American Medical Association had the foundation to undertake this job. It was work that would have taken the government a long time and considerable expense to complete. If and when war comes, the members of the medical profession of Montana will answer the call. We have in this association a Preparedness Committee which coöperates with that of the American Medical Association. One hundred per cent of Montana doctors have answered the preparedness questionnaires.

EDUCATION

We may commend the members of the Montana medical profession for their increased amount of post-graduate work, increased attendance at medical meetings, and for the writing of articles for the medical magazines. The members of this society are taking advantage of this form of education in greater numbers than ever before. Perhaps easy and quicker transportation has something to do with it. Our members attend yearly the most important medical gatherings from coast to coast, and their writings and case reports are published in our best and most widely circulated magazines. It all shows that Montana physicians have incentive and

*Annual address of president of Montana State Medical Association at Great Falls, Montana, June 23, 1941.

ambition to keep up with the progress in their lines of work. The past few years has seen refresher courses come to the physicians of Montana. This year the state was divided into four sections and courses were given in two sections; next year they will be given in the remaining two. These courses have been taken seriously and fairly well attended.

The courses together with the splendid work by the committee on maternal and child welfare have done much to reduce infant and maternal mortality. It is estimated by this committee that there has been a saving of approximately 185 lives per year.

The Montana Guild, of International College of Surgeons, was formed at a recent meeting held in Great Falls. Dr. Fred H. Albee, the president, attended and demonstrated bone and joint surgery.

FARM SECURITY ADMINISTRATION

Last fall a number of our county and district societies entered into contracts with low income farmers through the Farm Security Administration, or FSA. These contracts were given approval by the State Medical association after an investigation and a favorable report by the economics committee. An organization was set up in each society that had contracts to administer the funds and pro-rate the fees to the doctors for the work they did each month. The contracts were entered into mostly in farming communities. Thirty counties of the fifty-three in the state have contracts with doctors, covering two-thirds of the state and about three-fourths of the agriculture area. From all reports I have been able to obtain, this agreement has worked out satisfactorily. In Yellowstone county, the ten months that it has been in force, the returns pro-rated have been 54 per cent of fees that would be normally charged.

I quote from an FSA report for the state of Montana farmers: "In Montana there were 2,881 active borrowers at the end of 1940. The survey showed that the average borrower earned a net income of \$1,204 during the year, as compared with 786 in the year before he borrowed from the Farm Security, or a 53 per cent increase. These farmers are rapidly repaying their rehabilitation loans, already \$3,409,609 has been repaid on loans totaling \$9,413,861, although much of this money does not fall due for four or five years. In view of the fact that these farmers of low income were unable to get credit from banks or loan companies, and that many were on relief, it shows the earnestness and honesty of these people. They appreciate being given an opportunity to succeed in their endeavors."

In my contact with these borrowing low income farmers, I have not found one who is dissatisfied with the contract, and the doctors, it seems, are also satisfied to receive over 50 per cent cash for their work from this

low income group, where before they received little or nothing.

COURT TRIAL

In the trial of the government against the American Medical Association, in which the American Medical Association was charged as being a violator of the anti-trust act, the government was given the decision by a jury on April 4 and a fine of \$2,500 was imposed upon the medical profession. However, further action by the American Medical Association is pending. At the recent American Medical Association meeting in Cleveland, on June 3, the House of Delegates in executive session voted without a dissenting vote to carry the case to the highest court.

At the present time, the activities of the advocates of the Wagner Health Bill have subsided, due to the other more important and urgent threat of war. However, it is felt that when the time presents itself, further attempts will be made for politically-controlled medicine.

SOCIAL WORKERS

In the past, the medical profession has been the leading factor in sickness, but the field is being contested by various groups, one of which is the profession of social work. The Social Work Year Book of 1939 published by Russell Sage Foundation gives the various groups and distributions of social work organizations. This issue gives 45 national governmental organizations; 370 national and international private and voluntary organizations; 512 public state agencies. These statements were announced by Morris Fishbein in an article in a recent *Illinois State Medical Journal*.

The American Association of Social Workers has 11,000 registered members and there are many more both amateur and professional non-registered social service workers, which can be estimated as hundreds of thousands. There are 36 universities and colleges reported that give degrees in social work. In 1938 there were 7,404 students in these schools which is one-third the number of medical college students in the United States.

It has been estimated that there are about 1,250,000 persons who give their full time to the care of the sick. The medical profession represents 165,000. The cost of medical care is divided among the entire group and enters into the factors of the so-called high cost of medical care.

The question arises: who is to be the dominant factor in Medicine? The physician has had this position in the past. Now enters the politician, the social worker and the various non-medical practitioners. Will the medical profession lose this control?

To be dominant in medicine the medical profession must:

1. Keep from being politically controlled.
2. Supervise welfare and social workers. Keep Public Health Departments of the Government in the field of Preventive Medicine.
3. Maintain mutual relations between doctors and patients.
4. Maintain authority over all accessory and auxiliary associations.

The Surgeon General of the Navy, Rear Admiral Ross T. McIntire, (MC), United States Navy, announces the following schedule for examination for appointments in the Medical Corps of the United States Navy:

Acting Assistant Surgeon for intern training: October 6 to 9, 1941, inclusive. January 5 to 9, 1942, inclusive.

Assistant Surgeon: August 11 to 15, 1941, inclusive. October 6 to 9, 1941, inclusive. January 5 to 9, 1942, inclusive.

Examinations will be held at all of the larger Naval Hospitals and at the Naval Medical Center, Washington, D. C. Applications for authorization to take the examination must be in the Bureau of Medicine and Surgery three weeks prior to the date of the examination. Application forms for these examinations will be forwarded by the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., upon request.

The Late Effects of the Toxemias of Pregnancy*

John H. Moore, M.D., F.A.C.S.†

Grand Forks, North Dakota

OUR criteria for the diagnosis of a toxemia of pregnancy are: (1) Hypertension—a minimum systolic blood pressure of 140 and a minimum diastolic blood pressure of 90, (2) albuminuria, (3) edema. Two out of three of these signs must have been present before a patient is so classified.

During the twenty year period ending September, 1939, there were 57 patients in our series who satisfied the above criteria and who have been followed long enough to attempt a clinical classification of them.

For the past ten years we have been investigating the ophthalmoscopic findings in the clinic of all patients showing evidence of toxemia of pregnancy and for the past six years an ophthalmoscopic investigation of all of our pregnant patients has been a routine part of our prepartum examination. We have employed blood chemistry in cases of toxemia of pregnancy; but I make no further mention of these diagnostic aids in this connection except to say that they have sometimes influenced our treatment and our prognosis. The simple criteria that I have given remain our standard.

The clinical classification into the various types of toxemia was very simple. Subsequently, one can judge its accuracy! The cases were classified as follows: (1) Nephritic; (2) Pre-eclamptic; (3) Eclamptic.

I would like to mention cardiovascular-renal disease, hypertensive toxemia, essential hypertension, low reserve kidney or various types of nephritis in this connection but refrain from doing so because of lack of knowledge and a sense of confusion even though I may have the feeling that, ultimately, most of the toxemias of late pregnancy will be classified on a vascular basis.

Our patients in this series were classified as follows:

- | | |
|--------------------------------|-------------|
| 1. Nephritic toxemia | 25 patients |
| 2. Pre-eclamptic toxemia | 23 patients |
| 3. Eclampsia | 9 patients |
| | 57 patients |

Was there anything in the antecedent history of these patients that might have favored the development of a toxemia of pregnancy? I could find only two diseases that appeared with sufficient frequency to be noteworthy, i. e., scarlet fever and recurrent tonsillitis. In the nephritic group, scarlet fever appeared in the history eight times and recurrent tonsillitis eight times, i. e., 16 of the 25 patients suffered from one of these diseases. In the pre-eclamptic group of 23 patients, scarlet fever appeared in the antecedent history four times and recurrent tonsillitis eight times; and in the eclamptic group of nine patients four had had scarlet fever and one, recurrent tonsillitis. Thus in 57 patients with toxemia of pregnancy scarlet fever and/or recurrent tonsillitis

*Presented before the Chicago Gynecological Society, October 18, 1940.

†From the Grand Forks Clinic.

was noted in the histories of 33 or in approximately 58 per cent.

The parity of the patient when the toxemia was first noted is indicated in the next table.

Type	Parity								Total
	1	2	3	4	5	6	7	8	
Nephritic	15	2	4	3	1	0	0	0	25
Pre-eclamptic	11	5	2	2	1	0	1	1	23
Eclamptic	8	0	0	0	0	0	0	1	9
	34	7	6	5	2	0	1	2	57

Thirty-four of the 57 toxemias developed in primiparous patients or 59-plus per cent.

The next table gives the period of gestation when the toxemia was first noted.

Type	Month of Gestation									
	2	3	4	5	6	7	8	9	10	
Nephritic	4	2	2	1	5	7	4	0	0	
Pre-eclamptic	1	0	0	0	2	8	7	3	2	
Eclamptic	0	0	0	0	0	1	4	0	4	

To summarize: 14 of the 25 patients classified as having a nephritic type of toxemia developed the toxemia before the seventh month; in 20 of the 23 patients classified as pre-eclamptic, the toxemia appeared from the seventh month on. The one pre-eclamptic patient whose toxemia was reported as having begun at the second month was diagnosed as pyelitis of pregnancy when first seen. She had a blood pressure of 150/102 at that time, albuminuria and edema graded I and at seven and one-half months gestation labor occurred spontaneously and a still-born fetus was delivered. A subsequent five year follow-up on this patient revealed recurrent attacks of pyelocystitis, a moderate hypertension and numerous symptoms of nervousness and fatigue. Her ultimate classification should probably be nephritic.

The next table gives the fate of the infants born of these toxic mothers.

	Fate of the Infants		
	Premature (survived)	Term (survived)	Premature (Died)
Nephritic	10	3	13 ¹ (twins)
Pre-eclamptic	4	16 ² (twins)	4 ³ (twins)
Eclamptic	2	6	1

¹One set of twins born prematurely of a nephritic mother at the seventh month died in convulsions.

²One set of twins born at term of a pre-eclamptic mother survived.

³One set of twins born at the sixth month of a pre-eclamptic mother died.

To summarize the fate of the infants: Ten premature and three full-term infants born to mothers with nephritic toxemia survived, a salvage rate of approximately 50 per cent; 20 infants (four premature and 16 at term) born to 23 mothers with pre-eclamptic toxemia survived, including one set of twins, or a salvage rate of almost 87 per cent; and eight of the nine babies born to eclamptic mothers, or 88 per cent, survived.

In the total of 57 patients, there were three sets of twins, an incidence of about five per cent.

I now come to a discussion of the subject which prompted this report: The Late Effects of the Toxemias of Pregnancy. To state it another way: What was the subsequent health of these mothers?

Health is one of life's intangibles. It does not lend itself readily to laboratory analysis; nor can one establish clinical criteria by which to measure it. But if we may assume that good health, as applied to these patients, meant the ability to do their daily work, meet the demands of husband, home and family as wives and mothers are expected to do, and have enough energy left for whatever diversions life had to offer them, I believe that we can roughly classify them into various grades.

- Grade 1. No demonstrable impairment of health.
- Grade 2. Mild impairment of health.
- Grade 3. Severe impairment of health.
- Grade 4. Death.

The next table, roughly but graphically, tells the story.

	1	2	3	4
Nephritic	0	8	13	4
Pre-eclamptic	5	13	0	0
Eclamptic	1	2	1	0
Total	6	23	14	4
Total number of patients with toxemia	57			
Total followed one to 19 years	47			
Insufficient data or unaccounted for	10			

A more detailed analysis of the four grades brings me to consider these patients in subsequent pregnancies.

NEPHRITIC TOXEMIA

Nineteen of the 25 patients in this group attempted further pregnancies. One patient, who has been followed for 19 years and observed in each of her pregnancies, delivered premature living infants in her fifth and sixth pregnancies after four previous spontaneous abortions. Six patients aborted or consented to therapeutic abortion. One patient died in convulsions in the seventh month of her tenth pregnancy, undelivered. Ten patients were delivered of living infants by induction of labor between seven and one-half and eight months gestation. One patient delivered a still-born fetus at term.

Thus in these 19 patients with nephritic type of toxemia, there was a survival of 12 infants in 29 subsequent pregnancies.

PRE-ECLAMPTIC TOXEMIA

When we consider this group in the light of their subsequent pregnancies we begin to notice inaccuracies in our original clinical classification. Of the 23 patients, originally classified as pre-eclamptic, 13 were subsequently delivered by me and two have had no further pregnancies. The obstetric histories of the remaining eight patients is unknown. Of the 13 patients, only two had what might be called normal pregnancies and labors with all signs and symptoms of toxemia absent. Both of these had developed their pre-eclamptic toxemias as primiparous patients. Both were delivered of their second babies at term without incident.

The remaining 11 patients warrant brief clinical synopses:

Case 21747. This patient was diagnosed pre-eclamptic toxemia at the age of 22 in the eighth month of her first pregnancy and she delivered a living infant at term. In her second pregnancy she had a maximum blood pressure of 138/70, a trace of albumin and a trace of edema. She delivered another living infant at term. Three years later she had no further elevation of blood pressure but had an albuminuria, Grade I. It is quite probable that she has a low-grade nephritis.

Case 5418. This patient first came under my observation in her fourth pregnancy. The toxemia developed in the seventh month of this pregnancy, labor was very rapid in the same month and the baby died one hour after birth. Her fifth pregnancy occurred four years later and in the eighth month of this pregnancy she developed alarming symptoms of toxemia. She was delivered of a living infant which survived. Five years later she complained of chronic fatigue. She had a moderate secondary anemia, a low blood pressure and an albuminuria which graded I. It is my opinion that this patient belongs in the nephritic group.

Case 19285. This patient first developed what was originally diagnosed as a pre-eclamptic toxemia when she came to me in the eighth month of her third pregnancy and she was delivered of a living infant near term. Her maximum blood pressure at that time was 155/94, her urine showed a trace of albumin and there was slight pre-tibial edema. Her fourth pregnancy and labor were conducted without any demonstrable toxemia, but in her fifth pregnancy she developed a blood pressure of 166/100 at the eighth month, albuminuria and edema graded 4 and she was delivered of a living infant by induction of labor at the eighth months. Four years later, she still had hypertension and albuminuria and a sterilizing operation was done. This patient belongs in the nephritic group.

Case 16502. This patient developed pre-eclamptic toxemia in the eighth month of her second pregnancy and delivered a living infant at term. In the sixth month of her third pregnancy she had a secondary anemia, albuminuria and marked fatigue. A partial abruption of the placenta occurred in the second stage of labor and the infant survived. Four years later she had a slight elevation of blood pressure, a residual albuminuria, a persistent secondary anemia and she complained of weakness and dizziness. A low-grade nephritis seems evident in this case.

Case 16000. This patient developed a mild toxemia in the third month of her second pregnancy and delivered a still-born fetus at seven months. Albuminuria and edema were slight and her maximum blood pressure was 150/102. Symptoms of her toxemia disappeared within three weeks following delivery. She was delivered elsewhere of an anencephalic monster in her third pregnancy, and the only thing known about this pregnancy is that she had albuminuria. Five years later she returned to me with hypertension, anemia and pyelocystitis. She was sterilized. Since that time she has had numerous symptoms, chief of which are headache, fatigue. She has a transient albuminuria and her hypertension is essentially unchanged. One is justified in regarding her as a patient with nephritis.

Case 19531. This patient first developed her toxemia in the sixth month of her second pregnancy. She delivered a living infant at term. In her third pregnancy she delivered uneventfully at term except for a blood pressure of 146/100 and a trace of albumin. Four years later she was symptom-free.

Case 17323. This patient developed her toxemia as a primiparous patient at the seventh month and delivered a living infant at term. She came under observation in the fifth month of her second pregnancy and continued to term with no evidence of toxemia. She developed an auricular fibrillation in labor with marked evidence of cardiac collapse but she and her infant survived. Seven years later she showed no evidence of pathology except an elevation of pulse rate.

Case 17854. This patient first developed her toxemia in the seventh month of her first pregnancy and was delivered at term of a normal infant. In her second pregnancy she developed a trace of edema and albuminuria, with a blood pressure of 144/86 at the fourth month. She continued to term with no marked increase in symptoms but developed an abruption of the placenta late in the second stage of labor. The infant survived. In her third pregnancy she showed edema, pyuria and a blood pressure of 146/80 at the eighth month but delivered a normal infant at term. Eight years later there had been no further pregnancies but she complained of fatigue and tired easily.

Case 10765. This patient first developed her toxemia in the eighth month of her first pregnancy. In her second pregnancy she had a blood pressure of 130/76 and a trace of albumin when one month pregnant. At the fifth month she had a threatened abortion but was delivered at term of a living infant. At the time of delivery she had a blood pressure of 156/100; albuminuria graded I and she had a trace of edema. This patient undoubtedly has some kidney damage but because of her close coöperation she has carried through two pregnancies and has two living children. Eight years after her second and last pregnancy she complained of anorexia, fatigue and she showed a low-grade hypertension with albuminuria.

Case 23045. This patient's toxemia was first noticed in her third pregnancy. It was characterized by edema and albuminuria without hypertension. She delivered a normal infant at term. In her fourth pregnancy she developed an albuminuria, Grade I, blood pressure 130/70 and a trace of edema at the third month but was carried to term and delivered a living infant. Two years after this fourth pregnancy she showed a moderate albuminuria and slight hypertension. Obesity was marked. She is classified as having nephritis.

Case 12124. This patient first developed her toxemia at seven and one-half months in her fifth pregnancy. Her blood pressure was 150/110; albuminuria graded III and edema graded I. She delivered twins at term and the infants survived. There have been no further pregnancies but one year later she still had hypertension and albuminuria.

Case 21034. This patient was first seen in the seventh month of her first pregnancy with a blood pressure of 204/130, albuminuria grade IV and edema grade III. She went into labor shortly thereafter and delivered a viable premature infant. Her second pregnancy was characterized by a mild hypertension, 144/96, slight albuminuria and a spontaneous delivery of a normal infant at term. Her third pregnancy was essentially the same as the second except for an acute attack of appendicitis for which I did an appendectomy at the sixth week of pregnancy. Six years later she had a mild hypertension and her urine occasionally shows albumin.

Summarizing this group of 13 patients: two showed no evidence of recurrence of the toxemia; seven presented evidence of nephritis; two had abruptio placentae at term in subsequent pregnancies; one had moderate hypertension in pregnancy, but four years later was symptom-free and one developed an auricular fibrillation at term but four years later was symptom-free except for a rapid pulse. The important thing to me is that

of these 13 patients of the original group of 23 who were diagnosed pre-eclamptic toxemia, seven showed evidence of nephritis in subsequent pregnancies, four had questionable cardio-renal-vascular changes and only two had no untoward symptoms or incidents to mar their subsequent pregnancies. The shortest follow-up of this group was one year following the termination of the last pregnancy and the longest, eight years. Two infants, including one set of twins, survived in the 11 toxemia patients in subsequent pregnancies.

ECLAMPSIA

Eight of the nine patients developed convulsions in the first pregnancy and one in her eighth. Four of the nine had subsequent pregnancies. In one there was no evidence of toxemia in the next pregnancy and seven years later her general health was good. In another, the second pregnancy began 18 months after her eclampsia. Hypertension developed early and she aborted near the seventh month. The third patient developed marked symptoms of mitral stenosis in the fourth month of her second pregnancy. Recurrent sore throat made tonsillectomy advisable. She was delivered at term of a normal infant. Five years later her mitral stenosis was well compensated but she had a secondary anemia and a low-grade albuminuria. The fourth patient started her second pregnancy three years after her eclamptic seizure. Her blood pressure was 148/96. She again had albuminuria and labor was induced near term. The infant survived. Three years later this patient had a residual albuminuria.

Thus, of four eclamptic patients followed in subsequent pregnancies, one was a frank nephritic in her second pregnancy, two had hypertension as the chief symptom and one developed mitral stenosis. Three of the four infants survived.

Subsequent Toxemias

	Patients	Pregnancies Followed	Infants Survived	Infants Died
Pre-eclamptic	13	20	15	5
Eclamptic	4	4	3	1
Nephritic	19	29	12	10
Total	36	53	30	16

DISCUSSION

The simple grouping of these patients into the three groups, nephritic, pre-eclamptic and eclamptic, is inaccurate and inadequate, but in a clinical follow-up of patients it has one advantage: It tends to focus attention upon the subsequent lesions which appear most obvious. Evidence of renal damage has been the most readily demonstrable of the late sequelae in subsequent pregnancies. This was most evident in the group that were originally classified as pre-eclamptic where approximately 54 per cent (seven out of the 13) showed evidence of kidney damage in subsequent pregnancies. Next in point of interest in this same group of 13 patients were the four whose most outstanding sequelae I have grouped under the more inclusive term, cardio-vascular-renal changes. I feel that the vascular changes in them are of the utmost importance. Whether the

pathology is primarily in the kidney or whether the clinical evidence of kidney damage is merely the expression of vascular changes, I cannot say, although I am more and more inclining to the view that the vascular changes are fundamental. Follow-up of the four eclamptic patients in subsequent pregnancies brings me to a similar conclusion.

It is quite obvious that the classification of 14 out of 25 patients as nephritic toxemia should have been made before the seventh month of gestation, as was done; also, that in 20 of the 23 patients classified as pre-eclamptic, the diagnosis should have been established from the seventh month on. That is merely showing that they run true to the form expected of such toxemias in the text-book pictures of them. But when we come to study the subsequent health of the mothers, we lose some of our previous certainty. We are not surprised to find all of the nephritic group showing some impairment of health and with an eventual death from nephritis of four of the 25 nor, in the 19 who attempted 29 further pregnancies are we surprised to find that only 12 infants survived. What is disturbing to me is the fact that only two out of 13 from the original group of 23 pre-eclamptic patients subsequently had what might be called normal pregnancies and labors. In other words, about 85 per cent of them showed signs of toxemia. It is likewise very disturbing to find that four of the original nine eclamptic patients, followed in later pregnancies, showed three who had definite cardiovascular-renal pathology. Combining these last two groups gives us 17 patients, only three of whom had subsequent pregnancies uncomplicated by toxemia, or approximately 83 per cent. The survival rate of the infants, ten from the former group of pre-eclampsics, including one set of

twins, and three of the four patients who previously had eclampsia gives a much better infant mortality record than did the nephritic group.

CONCLUSIONS

1. The nephritic type of toxemia, as was to be expected, showed a high infant death rate, both in the original toxemia and in subsequent pregnancies. The only known maternal deaths in the series of 57 patients comprising this study occurred, remotely, in this nephritic group where four of the original 25 ultimately succumbed to their nephritis.

2. The pre-eclamptic and the eclamptic groups, while they showed no mortality, gave evidence of recurrent toxemia or of permanent cardiovascular-renal changes in 83 per cent of the cases in subsequent pregnancies.

3. The toxemic manifestations in this group were chiefly hypertension and albuminuria. These findings recurred with sufficient frequency to lend color to the view that ultimately we may expect to work out a more accurate clinical classification for the so-called toxemias of late pregnancy on a cardiovascular-renal basis and that the renal changes which do occur are probably vascular in origin.

4. One is not justified in dismissing the pre-eclamptic or eclamptic patient after a few weeks or months observation postpartum with the feeling that her pathology is ended with the termination of that immediate pregnancy or puerperium; rather should such patients be followed over a period of years. One should regard subsequent pregnancies in them with added concern because of the history of a previous toxemia.

I am indebted to my associate, Dr. H. Robert Ransom, for the collection of the data which made this study possible.

Seeking an outstanding physician for an important position, the Los Angeles County Civil Service Commission has just announced an open competitive examination for Medical Director of the County tuberculosis sanatorium. The salary for the position is \$500 a month and the usual three-year County residence requirement has been waived, thus allowing all qualified men who are United States citizens to participate in this examination.

In order to qualify to take the examination, men between the ages of 35 and 55 must have been graduated from an approved medical school with a degree of M.D. and have had at least five years' experience as a specialist in the treatment of tuberculosis. Of the five years' experience, three or more must have been in a responsible administrative and executive capacity in a sanatorium or hospital.

Application blanks and additional information regarding the position can be obtained from the office of the Civil Service Commission, Room 102, County Hall of Records, Los Angeles, California. Applications must be filed with the Commission by October 15.

Fractures of the Fingers

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IN the fingers, tendons, pads, nerves and blood vessels are all that exist between the bones and skin. Given a traumatic injury, the functional parts of the fingers are damaged very severely when a fracture is produced by trauma. This trauma may be severe enough to break down to suppuration or it may simply devitalize the individual cells. These will absorb through the process of swelling and in the circulatory changes without any serious effect. However, it is always advisable to regard the danger which may have been done to the tendons and tendon sheaths. These are in direct apposition with the bone. The violence producing the fracture traumatizes, to a great extent, these tendons. The sublimis and the profundus tendons each have their own sheath. The sheath is very fragile and trauma will produce a synovitis. This synovitis, if severe enough, will cause adhesions and these adhesions will necessarily require manipulation in the post-fracture care.

Insurance companies and accident commissions throughout the United States are prone to evaluate the loss of a finger as rather small. If the finger is not amputated, the percentage of allowance becomes progressively less as the injury is more distal to the hand. As an example, the distal phalanx may have no power of extension, yet the individual receives approximately \$25 for that disability. This so-called "baseball" finger is always in the way when a man is working.

The compensation for amputation of a finger, which is equivalent to its entire loss, varies somewhere between \$150 and \$600, depending on the finger, the thumb being worth about \$600. This will in no way remunerate the individual for the loss of the finger. Fingers are needed, and impairment of the function of one or more necessarily impairs livelihood. A stiff finger will keep an individual from some desired position. Loss of a finger is more serious, and in some railroads the loss of parts of two fingers on one hand prevents employment. In many fracture cases where poor results are obtained, the man would prefer the finger amputated to the disability of an unamputated finger. It is for these reasons that particular interest should be given to the care of fractures of the fingers.

SURGICAL ANATOMY OF THE FINGERS

The interosseus tendon is attached to the proximal end of the first phalanx, and the tendon of the lumbricales muscles are attached to the distal portion of the phalanx and extend onto the proximal portion of the second phalanx. A fracture through the middle or near the proximal end of the proximal phalanx immediately buckles or angulates, due to the fact that the lumbricales muscles tend to shorten that particular bone. The flexor and extensor tendons also increase this tendency toward angulation. Since the bone itself is an arched

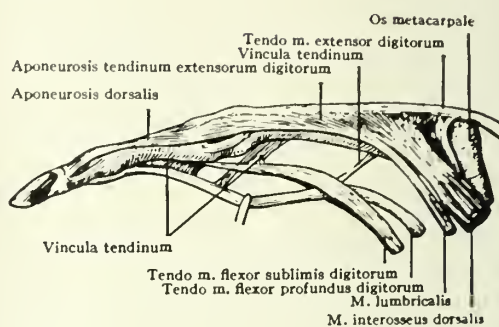


Fig. 1. Anatomy of the Finger, from Gollander's Surgical Anatomy.

bone, with concavity on the palmar surface, this tendency toward shortening of the finger forces a still further angulation. The tendency is to an over-riding of the fracture. This tendency exists in all four fingers as well as in the thumb.

In fractures of the middle phalanx the above conditions are much more infrequent unless the trauma produces that angulation. There is also the tendency of the extensor and flexor tendons pulling on the finger to produce an angulation of that particular fracture, but it is not so marked as in the proximal phalanx. The method of reduction of fractures of the different phalanges are necessarily different.

CLASSIFICATIONS

Fractures of the Proximal Phalanx as previously stated are much more liable to angulate or over-ride. The over-riding may be lateral, anterior, or posterior angulation.

Fractures of the Middle Phalanx may be somewhat angulated, but not so frequently as in the proximal phalanx. The direct trauma may give a lateral angulation of the fractured bone.

Any mal-alignment of the fractures of the distal phalanx is the direct result of the trauma, and is not affected by muscle or tendon pulls. When once reduced the reduction remains, and is maintained by splinting.

Fractures of the Spongy Portion of the Distal Phalanx are usually well comminuted with a considerable amount of soft tissue involvement including ecchymosis beneath the nail.

In fractures involving the *joints*, unless the piece of bone is very small, the finger should be immobilized for at least three to four weeks, with the finger in proper alignment. If only a chip is broken off, the finger should be placed in proper position for two to three weeks followed by active and passive motion which is started immediately after protection.

Compound Fractures of the Fingers. In compound fractures, the soft tissues are seriously damaged. The tendons may be partially, or even completely severed.

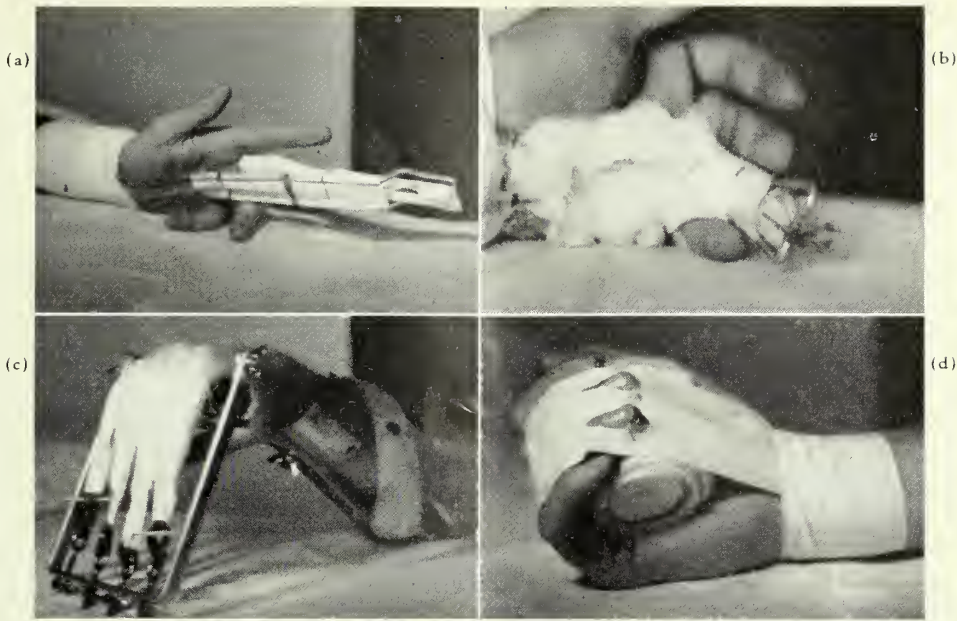


Fig. 2. (a) Split made for individual fracture. Wire incorporated in cast around the wrist. Wire must be pliable, yet large enough to hold the position when curved. Method also good for fractures of Metacarpals. (b) Wire is well padded to prevent pressure necrosis. (c) Banjo Splint, angle type, to conform to anatomy of bones. Each finger has own individual traction. (d) Roller Bandage. Tape is split to avoid pressure on nails. Some traction can be secured by first securing to dorsum of wrist and rolling the fingers by the tape in applying.

METHODS OF REDUCTION

In treatment of fractures of the *proximal phalanx* the essential thing is traction and alignment of bone. The traction, as carried out by the writer, is the use of a wire incorporated in a cast around the wrist. This passes snugly over the palm of the hand beyond the fingers forming a loop. A web of adhesive tape is fastened across this loop on the palmar aspect of the finger. A wire is placed through the distal phalanx and attached to this loop. The loop is then forcibly curved, pulling the finger with it into a semicircle following the normal contour of the palmar surface of that bone. In doing so, an extension is obtained, and is maintained by this method. Extreme aseptic care should be taken in the introduction of this wire. The same care is exercised in the removal of the wire.

In the case of *multiple fractures* of the proximal phalanges, the banjo splint of the hinge type is used, so that the fingers may be pulled to secure the proper angulation. The amount of extension necessarily can be varied as it is checked by X-ray examination. The writer's experience in the use of traction on the fingernail has been most discouraging. He has found that it becomes very painful to the patient. After a few attempts he has quit using it.

Not infrequently, moleskin tape has been used to secure traction of the fingers, but it is found to be of use only in those cases where there is no marked angulation and no shortening. This is probably the least disturbing traction that can be used, but it is prone to slip if there is much traction necessary.

Fractures of the Middle Phalanx. Angulation is common in fractures of the middle phalanx. Usually by mere traction by hand the misalignment of bone can be corrected. A palmar ball, or a large roller bandage may be placed in the curve of the fingers. This is maintained in place by adhesive tape of the moleskin variety, extending from the wrist over the dorsal aspect of the finger when closed over the bandage or ball. This is carried on to the volar surface of the wrist. Care must be taken that a portion is split over the finger nail. Pressure on the fingernail becomes very painful. If only one finger is involved, a one inch roller bandage is sufficient, keeping the other fingers free for manipulation and massage.

Where there is any extension or manipulation of the fracture line, it is always advisable to inject procaine, metacaine or novocaine of the desired strength in the fracture line. This will relieve entirely any pain that may be experienced in the process of manipulation.

Fractures of the *shaft of the distal phalanx* are treated in the same way as fractures of the middle phalanx. Injection of a local anesthetic is needed in correction of alignment. The finger can then be placed in an aluminum splint or roller bandage as previously described.

Fractures of the *spongy portion of the tip of the distal phalanx.* The fingernail should be drilled and the blood beneath the nail drained. A protective aluminum splint of some nature, over the tip of the finger, is then applied. If the spongy portion is badly comminuted it can be pressed together and held in that position. Any lacerations of the soft tissue should be sterilized and can

be brought together with narrow strips of adhesive tape. The time of disability should be comparatively short, one week or less. Protective time should be about one month. Fractures of the middle phalanx require about three to four weeks. Fractures of the shaft of the distal phalanx occupy from three to four weeks disability and protection.

Where spicule bone prevents proper apposition of fractures, or there is a side-shortening of the bone, it may be necessary to do an open reduction. The incision for this is made on the radial or ulnar aspect of the finger. The incision should not go beyond the adjoining joints. The bone is then exposed, the tendons with their sheaths are separated from the bones and held by a self-retaining retractor. Care must be taken not to disturb the tendon sheaths. The bone is then inspected, intervening pieces removed and spicules cleaned out so that a perfect adjustment of alignment can be made. No fixation is done to the bone. The skin and subcutaneous tissues are sutured together. With this method there is no foreign substance left in the tissue. The finger is then placed in the proper fixation by any of the methods previously described.

In the case of *multiple fractures* wherein one bone particularly can not be properly aligned, time should be permitted to elapse for a beginning bony union in the other fingers. This interval of time may be from two to three weeks. In such a condition there is very little danger of breaking down fracture lines of the other fingers. The callus formation of the bone to be operated upon can be removed. Massage and passive motion can be instituted on the other fingers while the last offending finger is being maintained in proper position.

Evulsion of the proximal end of the distal phalanx at the insertion of the extensor tendon of the phalanx—the so-called "baseball" finger—is very difficult and is very apt not to remain reduced. If operation is done, the proximal end of the distal phalanx is drilled and a small size of kangaroo tendon or 60-day chromic catgut is introduced through the drill hole. This is again tied through the extreme distal end of the extensor tendons. The finger is then placed in the same position as a non-operative reduction, that is, a cock-up aluminum splint, bringing the last joint as far dorsally as possible. This will throw the bone and the fracture chip in apposition. Very seldom, however, is open reduction indicated. In this, as in all other open reductions, a tourniquet should be used.

POSTOPERATIVE CARE

Time of protective disability has already been given. As soon as the protection is removed, before active and passive motion is instituted, the finger should be frequently massaged. Contrast bubbling baths should be given and the hand and the skin massaged lightly with any vegetable oil. Heat is also an advantage, preferably dry.

As soon as the callus is sufficient to permit motion, passive motion should first be instituted, so that the joints may become flexible. Exercise is then used to free adhesions along the tendons. Active and passive motion should be instituted in all cases. The presence of adhesions will determine whether or not rubber bands should be used. If rubber bands are used they should be so placed as to produce a continuous pull against the adhesions.

Too much importance cannot be placed on *massage* and complete functional result of the soft tissue. With the reduction of fracture and bony union the responsibility of the operator is only half fulfilled. In postoperative care of fractures there is no such thing as sentiment. The end-result is all-important, and a moderate amount of pain must be tolerated in all postoperative care of fracture. Tolerance and coöperation on the part of the patient will eventually give the end-results desired.

CONCLUSIONS

X-ray films should be taken frequently, always from two angles, first for the nature of the fracture, and second for the alignment of bone after the reduction. Manipulation should persist until bony alignment is attained, as shown by X-ray. Again X-ray films should be taken at the proper time to establish the presence or absence of bony union. Non-union is rare in these fractures but delayed union is frequent. Early manipulation is very apt to give prolonged, delayed union; therefore, the necessity of X-ray films to determine bony union.

When a *wire* is used, care should be taken that too much angulation might over-correct and give a deformity the opposite of that which is produced by the fracture. When only one or two fingers are fractured, the other fingers should be fully exercised and massaged. The forearm should be massaged to keep the muscles in good physical condition. All appliances, if not properly padded, are prone to produce pressure necrosis. Padding in those places where necrosis might develop must be done carefully and thoroughly.

History and Development of Student Health Programs in Colleges and Universities*

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I. THE EARLY DAYS OF STUDENT HEALTH

THE close relationship and interdependence of Health and Education have been generally recognized since the classical times. This is not to say that there have not been periods—sometimes hundreds of years in length—when this concept was forgotten or ignored and the body was neglected while the educational efforts were focused on the intellect and the spirit—"The flesh was mortified and the spirit extolled."

However, in modern times the health of the student in a residential school or college has almost always been a major concern to the institution authorities, and efforts to promote health and to prevent sickness in such institutions were common enough even in the early history of this country, especially following the appearance of an epidemic in the group, but were frequently limited and inadequate, and were soon abandoned when conditions returned to normal. It's not difficult to understand this situation when one considers the limited knowledge available up to the latter part of the 19th century, even to well educated men, regarding the various factors that affect health. It is all the more remarkable then, that upwards of 90 years ago, there was developed at Amherst College a practical philosophy of health and a program of administration and activity that in principle, and in many details, are as dependable today as they were when President Stearns influenced the trustees of Amherst to approve the addition of a new department—Physical Education and Hygiene—to deal with the protection and promotion of the health of the students.

The nature and real significance of this pioneer project are not commonly appreciated, and since it involved many considerations and objectives that are valid today, you may be interested in a brief outline of its character and development.

In 1856, the recently appointed President Stearns recognized the fact that there were serious defects in the educational program, and made the following observation: "Students of our colleges have bodies which need care and culture as well as the intellectual and moral powers, and which need this care at the same time with higher education." His next statement showed that he had been studying student conditions at Amherst and that he had found them undesirable for he goes on to say: "The breaking down of the health of the students, especially in the spring of the year, which is exceedingly common, involving the necessity of leaving college in many instances, and crippling the energies and destroying the prospects of not a few who remain, is in my opinion, wholly unnecessary if proper measures could

be taken to prevent it." He argued that the principal factor responsible for these student disabilities was the *change in environment and habit of life*; that boys, before they came to college in those days, had lived a life that was largely out of doors and included a good deal of physical activity, whereas in college they were indoors a large part of the time and took little, if any, regular exercise.

Three years later, the trustees, on motion of Dr. Nathan Allen, added a new department to the college and established a new professorship in physical education and hygiene. Dr. Allen went further in his suggestions, which briefly are as follows:

1. The professor shall be a thoroughly educated physician and a member of the college faculty; and it is distinctly understood that the health of the students shall at all times be an object of his special watch, care and counsel.
2. He shall give instructions to the students in gymnastics—for which a suitable gymnasium was built.
3. In addition to such instruction as may be expedient on the subject of health, which shall be on the same basis as other studies, he shall also give lectures on hygiene, physical culture, the laws of life and health and some consideration of anatomy and physiology.

Now I think you can begin to see the factors that made this first program of student health so amazingly broad in its concept, and so successful in its operation by Dr. Hitchcock for upwards of fifty years, that it has been, and still is a model. These factors are:

1. President Stearns, who could see beyond his academic nose, diagnosed an undesirable situation in his institution, and decided that something must be done about it.
2. Dr. Allen, a medical member of the Board of Trustees, who had the vision to map out a program that was broad, inclusive and adequate in principle to deal with all phases of the situation, under changing conditions.
3. Edward Hitchcock, M.D., Harvard 1853, who was appointed professor of the new department. He was the son of a professor of geology; a student of Agassiz in this country, and of the great scientists Owen, Leidy, and others of similar type in England; a teacher of science and further equipped by the best medical education of the time. Not the least of his assets which contributed to his success in dealing with this innovation in college education were his charming personality, hard headed common sense tempered with humor, great enthusiasm and vigor as a leader of exercises, and sympathetic understanding of young men.

*Presented at the twenty-first annual meeting of the American Student Health Association at the University of Michigan, Ann Arbor, December 27-28, 1940.

†Professor Emeritus Health and Physical Education, Princeton University.

Now it is one thing to have a plan, even a good one, but it is another matter to make it operate so as to produce the desired results. So it will be worth our time to study the way in which the new professor analyzed and organized this plan, how it was administered, and what its results were.

In the first place, he made a careful study of his *human material*, and he dealt with *each individual as a person!*

1. Each student was given a medical and physical examination annually, oftener if necessary.
2. A course of instruction, including laboratory work, was conducted throughout the four years, on the "hygienic way of life."
3. Regular exercise was prescribed for each student throughout the college course.
4. He provided medical treatment for those students who were sick.
5. He made an annual report of the kind and number of sicknesses from which students suffered, and on other phases of the department work.

Now this man was a scientist; he took nothing for granted, but observed, measured, recorded, and compared the results of various phases of his program, e. g.:

1. He made a very significant observation on the increased freedom from illness as the student progressed in his course:

Taking as a standard the amount of	
sickness in the freshman year as	1,000
then in the sophomore year it was	912
junior year it was	759
Senior year it was	578

2. He compiled the first tables showing increment of growth and strength from year to year, in men of college age.
3. He made a comparison of attendance at certain required exercises, which has amusing implications: Chapel—80% to Gymnasium 84% in one year, and Chapel—87% to Gymnasium 93% in another.

He wrote a textbook in 1860 on Anatomy and Physiology in preparation for his courses in hygiene, probably the first book of its kind in the history of education.

I have here a copy of the edition of '73 from which I quote: His concept of the term hygiene was that it "signifies rules for the perfect culture of mind and body. It is impossible to separate the two. For a perfect system of hygiene we must combine the knowledge of the physician, the schoolmaster and the priest, and must train the body, the intellect and the moral soul in a perfect and balanced order;" and this significant statement in one of his reports: "Much of the work in this department is done with individuals, and in ways where it is *not seen or known* by the multitude." Was he perhaps the first college mental hygienist?

This reminds one of the conviction of Richard Mulcaster, a great schoolmaster in the time of Queen Elizabeth, who contended that: "The exercise of the body should always accompany and assist the exercise of the mind to make a dry, strong, hard, and therefore, long lasting body, and by this means to have an active, sharp,

wise and well-learned soul. Therefore, I assign both the framing of the mind and the training of the body to one man's charge, for how can that man judge well of the soul whose work has to do with the body alone, when he, having the soul only committed to his care, hands over the body to some other man's treatment." Thus old Richard Mulcaster, who in the course of 25 years, turned out such famous scholars as Edmund Spenser, Bishop Andrews and Sir James Whitlock, King's Justice, who were outstanding in the Elizabethan period.

II. THE INFLUENCE OF THE AMHERST PLAN ON OTHER INSTITUTIONS

The next stage of this history is, on the whole, disappointing in contrast with what we have just been considering. It is rather puzzling, as one looks back over the years, to understand why other first rate institutions failed to inaugurate and support an adequate program for the protection and promotion of the health of their students. This is particularly marked in view of the judgment expressed by so eminent an educator as President Eliot, who said years ago: "It is to Amherst College that the colleges of the country are indebted for a demonstration of the proper mode of organizing a department of Physical Training."

It may be that this example of "cultural lag" was due to the tendency on the part of Trustees and Faculties of Colleges for men, to regard any service or attention to the physical welfare of the individual as "unacademic" and for some esoteric reason unworthy of association with intellectual activities and training.

Whether this suggestion be warranted or not, it is worthy of note that the *business men* who founded the first colleges for women, took a broader and more realistic view of education, inasmuch as they regarded it as a discipline of body, mind and emotions which would provide a sound basis for successful living. Mathew Vassar, who founded the college named for him and opened to students in 1865, and Henry Fowle Durant, who founded Wellesley in 1875, gave full consideration in both the earliest plans and later developments, to provisions for the promotion and protection of student health. Both men drew upon the best knowledge of the day in making plans for buildings in which living and working quarters were spacious, sanitary, well heated, and ventilated, and in addition contained corridors that were purposely made wide enough to permit exercises in inclement weather.

Obviously these buildings were unusual in their evidences of originality and purposeful planning to meet needs generally disregarded; but the most noteworthy feature from our special point of view was the special provision in both colleges for the *care of sick students*. Each of these buildings contained a medical unit which consisted of an infirmary, a convalescent room, living quarters for a resident physician and a trained nurse, and finally, a consultation office where students and faculty could be given medical advice. It appears then that Vassar and Wellesley were the pioneers in furnishing infirmaries for the medical and nursing care of sick

students. In addition to provisions for the early recognition and treatment of any illness that might occur, there was also in both these colleges, from their earliest days, a positive program for the promotion of health and well being, consisting of instruction in physiology, anatomy and hygiene, together with daily periods of formal exercises and suitable athletic sports and games, either in the gymnasium or the athletic fields which were provided in both institutions.

This was in no sense a perfunctory program. It was organized and conducted by specially trained physicians and teachers of physical training, who formulated their objectives, dealt with each student according to her needs and capacities, and made periodic tests to measure progress. These courses and activities were not only on an equal footing with other departments of work under ordinary conditions, but on occasion the welfare of the student took precedence over every other consideration.

It is apparent then, that for many years college girls enjoyed the benefits of a much more general and better coordinated program of health and physical education than was provided for their brothers. The absence of intercollegiate contests with their peculiar problems and limited objectives, which distracted attention from the importance of every day service for the non-athletic student, was no small factor in providing freedom for the development of a high standard of efficiency and service in the program of Health and Physical Education.

In the light of the foregoing, I think that no one will question the suitability of coupling with the name of Dr. Hitchcock as the outstanding leader in this field, the names of the pioneer resident physicians and physical directors in the girls colleges: Alida C. Avery, M.D., and Delia F. Woods at Vassar, and Emilie Jones, M.D.,[‡] and Ida F. Parker at Wellesley.[§]

To return to the men: The next official appointment to a position analogous to the one at Amherst was made in 1869 by President McCosh, of Princeton, who appointed George Goldie to the post of Director of Gymnastics and Athletics, which he held, except for a couple of absences, until 1911. But no bed care for men was provided until 1892, when the first college hospital in the country was erected. This was in memory of Mrs. McCosh, who was always very active in searching out and caring for sick students. Then, in 1879, Dr. Sargent was appointed Director of Harvard Gymnasium, but no provision was made for medical service. In 1891 and 1892, two new Universities, Leland Stanford and the University of Chicago were opened. Both made provision in unified university departments for medical ex-

[‡]It was recently learned that this lady is married—is living in California, and celebrated her 100th birthday in October, 1940.

[§]These references to the history and status of health and physical education in girls' colleges are worthy of much more adequate treatment than the space in this already too long paper will permit. As a matter of fact, material is available which would make a very valuable and interesting paper on this little known phase of Student Health and Physical Education.

aminations and service (dispensary only at Chicago) physical training and athletics.

During the twenty years, 1879 to 1899, departments were established in addition to those listed by name, in upwards of thirty institutions in the country. The titles of the departments and of the directors varied widely, as did their programs of work and services, and their inclusion or not in the list of regular University departments. A large proportion of the men holding these positions during this period were medically trained, but many of them did practically no medical work, apart from that connected with the routine physical examinations. Even in this connection, the list of medical observations was small, and little use was made of the records as guides for directing individuals. Much emphasis was placed on anthropometry, body symmetry, strength tests, and formal exercises.

During this period intercollegiate athletics developed with great rapidity, generally under the control of the alumni, rather than the faculty, trustees or gymnasium director. The medical director was seldom in a position of authority, as regards decisions on questions of fitness for athletic competition, either before or during the playing season. Such decisions were generally made by the coach or trainer of the teams, or by a physician selected by the manager of the team or squad, to whom he was responsible.

It should be noted here, because of its rarity, that during the nineties and early 1900's, two medical men, Drs. Darling and Nichols, who were appointed as advisors for the Harvard rowing and football squads, made extensive studies on the physiology of rowing and on football injuries that were scientific in method and conclusion, and were of unique value. It is interesting also to note that during this same period, until 1904 when the student hospital was built, the only medical service provided for students by Harvard University was in a dispensary. This was a period of great activity and many controversies on such topics as: physical examinations, strength tests, programs and systems of exercise—German, Swedish, American, etc.—competitive athletics, purposes, standards and methods. Progress was marked by difference of opinion, both as to objectives and methods, which frequently resulted in sharp clashes of personalities. The directors were men of force, conscientious, hard-working, and generally thrown pretty completely on their own resources, but with limited budgets and inadequate assistance. Also, while these services were, with few exceptions, conducted by individuals and groups who were officially associated with the institution, never-the-less with a few exceptions the gymnasium or athletic directors were not members of the faculty, nor were their varied services recognized as a coordinate department of the college or university. Much money was expended on buildings and equipment, which could be seen, but for the most part the faculties and trustees were satisfied with a "hopeful attitude" in regard to the health and welfare of the average student, and left the medical and gymnasium directors to work out their problems as best they could.

III. THE DEVELOPMENT OF THE NATIONAL ORGANIZATIONS

There developed slowly a recognition of the need for an organization that could serve as a forum for the discussion of the questions listed above and similar topics. The first move to this end was taken by Dr. W. G. Anderson, then at Adelphi Academy, who called together a group of representative men and women for a meeting in 1885, which resulted in the organization of the American Association for the Advancement of Physical Education. This served all purposes for ten or twelve years, when, again on the initiative of Dr. Anderson then at Yale, the college men, while still retaining membership in the original organization, formed the Society of College Directors of Physical Education in 1897. Both these organizations have continued side by side to the present day. The American Association for the Advancement of Physical Education—under various titles—tended toward concentration on health instruction, physical education and recreation in public schools, while the college directors struggled with many new and important phases of the work in higher institutions, e. g., medical supervision and service, courses in hygiene, programs of activities, tests of progress, competitive athletics, with many new problems regarding objectives and relationships.

As time went on, both these organizations increased in size and influence, and were responsible for the recognition by educators of the potential value of physical training as a part of the school program; but as interest in this work developed with great rapidity in additional institutions, it became increasingly difficult to find enough men and women of medical or scientific training who were qualified to plan and supervise the programs in the public schools and colleges. As a natural consequence, a constantly increasing proportion of the positions in colleges for men and in school systems were filled by men whose reputation, training and experience had been gained for the most part on the athletic field. Many of them did splendid service and frequently exerted a more powerful and wholesome influence on the students than any other college officer; but the knowledge, influence and service of the medically trained men were missing from the physical examination room, the training quarters, the classroom and the service to sick students.

As a matter of fact, the function of the public school doctor was, and is, generally limited to the inspection for infectious diseases, so that other students might not be exposed, while medical treatment for the sick college boy was frequently turned over to a local physician. Meanwhile, the directors of health and physical education in public school systems and some institutions of college rank, were drawn from graduates of training schools, and sometimes were more academic than practical which accounts in part, at least, for the unsatisfactory results in the Selective Service examinations.

The centrifugal tendency represented by the lack of essential agreement regarding objectives, organization, and activities, together with the lack of an adequate

supply of men of broad training, resulted in a desire on the part of the doctor, leader of physical training activities and the coach of special sports, to specialize each in his own field without much concern for what the others were doing. This was greatly accelerated by the rapid rise of interest in intercollegiate competitive athletics, in which participation was limited to a relatively small percentage of students.

The schools, both public and private, imitated the colleges, so that while in many institutions one phase or another of the general program of hygiene and physical education was well done, on the whole the appreciation was lost of the *fundamental unity* of these health services and physical activities as an essential factor in the educational process.

The relative inadequacy of our general concept of what constitutes a sound program of hygiene and physical education, and the failure of those in common use to counteract the softening influence of modern life throughout the country, were dramatically demonstrated by the results of the examinations of millions of men in the prime of life, who were drafted for army service in the World War. It would be unwarranted to place upon the men in hygiene and physical education all the responsibility for the deficiencies that were disclosed. On the other hand, we must accept our share of the blame for these results, particularly in view of the equally dramatic demonstration of the value of a well devised and administered program of physical training, combined with various forms of athletic sports and individual contests, in improving the health and physical efficiency of several million men in the army training camps.

The public was shocked by the reports of the large percentage of rejections during the last war because of obvious physical defects; but the experienced and observant medical man was even more shocked by the implications that were inherent in the segregation in so-called "development camps" of thousands of young men who couldn't quite "take it," and the recognition of the fact that upwards of 50 per cent of those accepted as physically sound might well be classified as "physically illiterates."

IV. A SEPARATE ORGANIZATION FOR STUDENT HEALTH

Even before the war the opinion had been expressed by some of the college doctors who were responsible for the medical treatment of students in hospitals and dispensaries, for instruction in hygiene, and for the medical supervision of athletics, that the subject of student health in its various phases was worthy of more study and attention than was available in the programs of the College Directors Society and of the National Collegiate Athletic Association, which was organized in 1905. Also, it was felt that the time was ripe for a definite program of information about the importance of this type of medical service and supervision, the desirability of encouraging the establishment of similar services in the large number of educational institutions where such serv-

ices were lacking, and for the expansion and enrichment of the programs already in progress in a relatively small number of colleges and universities.

Eventually on the initiative of Dr. John Sundwall, aided and abetted by Dr. Warren Forsythe, a small group met in Chicago on March 4, 1920, to discuss the proposal made by Dr. Sundwall that a separate organization of college medical officers should be formed. The discussion centered upon the following question: Is the program of health services, composed of medical examinations, supervision of athletic teams and other physical activities, clinical service in dispensary and hospital, supervision of sanitary conditions, and formal instruction in personal hygiene, now existing in various combinations in different institutions, sufficiently important to warrant the development of a separate organization which would give particular attention to these phases of student life?

In the course of a prolonged discussion of all phases of the above question, Dr. Haven Emerson advised against the creation of an independent organization to deal with student health and suggested that the college medical officers affiliate themselves with some national body already in existence, such as the American Public Health Association. It is only fair to say that this opinion expressed by Dr. Emerson was shared by a few of the men actively engaged in college health with whom the suggestion of a new organization was discussed. However, most of those present favored further study of the proposition, and a temporary organization—consisting of Dr. Sundwall, chairman, Dr. Forsythe, secretary, together with Dr. Reed and the writer—was set up for the purpose of formulating recommendations regarding the scope and function of the proposed organization. This group met the following day and formulated the following report, which if approved was to be submitted for discussion and final action to a meeting of college physicians to be held at some suitable time in the near future.

It was recommended (1) that a permanent organization of college medical officers be formed, (2) that the first meeting of those interested should be held at a place and time which would be convenient for members of the National Physical Education groups, the College Directors Society and the N. C. A. A., (3) that the name be the American Student Health Association, (4) that a survey be made of the college health services now in existence, and finally, (5) that a draft be prepared of a constitution and by-laws.

Notices of the time and place decided upon for the first meeting were sent to a large number of colleges and universities and to national organizations such as the National Committee on Mental Hygiene and the Inter-Departmental Social Hygiene Board. Thirty-seven (37) representatives of these institutions and organizations attended the first meeting which was held in Chicago on the 31st of December, 1920. The success of this new organization was outstanding from the start; its membership grew steadily—there are now upwards of 200 institutional members, not including members of

Sectional groups—and its influence upon the development of medical service programs in institutions previously without such service, and the improvements in the scope and quality of work in organizations already in existence was most marked.

The value and extent of the activities of this organization are too well known to all of you to need any further elaboration. The fact is that the organization has done a magnificent job and has more than justified the hopes of those who initiated its founding. It is only fitting that notice should be taken again at this point of the very real debt that we owe to Dr. Sundwall for his initiative.

The list of accomplishments is long, but a few of the outstanding contributions to student health should be mentioned as typical:

1. The wide extension of adequate medical examinations and high grade clinical service in colleges and universities.
2. The prevention of serious illnesses and the reduction of loss of time from scholastic work as a result of early diagnosis and treatment.
3. Standardized forms for reports of clinical work for permanent record and the study of comparisons and trends.
4. The promotion of conferences and symposia at annual meetings, on the prevention and treatment of athletic injuries, and on the recognition and treatment of personality difficulties.¶
5. The systematic examination by modern methods for incipient tuberculosis.

The founders of this organization have good reason to feel proud of their success in bringing about the expansion of this medical service along modern lines of prevention and correction of conditions in eyes, ears, lungs, cardiac conditions, postural defects, etc., and in encouraging the development of a program for the protection of candidates for athletic teams. Equally praiseworthy are the results of a long campaign to influence, by precept and example, many additional colleges and universities to establish similar services for their students.

There are, however, two important questions that are worthy of careful consideration at this time:

1. Have we developed in the various phases of our work, a degree of specialization that has resulted in a *lack* of that coördination among these services that should be maintained in order to assure the best results to the individual student?
2. Is there any evidence to indicate that we have recognized the existence of new problems and sit-

¶Credit for calling attention to the importance of personality problems among college students and the necessity of making provision in the Health Service for dealing with them is due to Dr. Stewart Paton, formerly lecturer in psychiatry at Johns Hopkins Medical School. Dr. Paton inaugurated this service in Princeton in 1910, and carried it on in connection with the department of health and physical education until about 1925. He has been the most influential factor in bringing the importance of this service to the attention of responsible groups in schools and institutions of higher education as well as to the Surgeon General of the War Department early in the World War.

uations, that have gradually developed and have become increasingly important during the past twenty years or so, in their influence on the fundamental development of the individual; and have we brought to bear upon these problems the resources of medical science and training?

V. AN EVALUATION OF PRESENT CONDITIONS

This organization is celebrating its twenty-first birthday. Its work stems from other organizations with similar purposes that go back more than half a century. We have reached an age and a period in our development which furnish us with an opportunity to look both backward and forward, so as to estimate our success in meeting situations as they have developed currently, and to readjust our outlook and plans for dealing with changing conditions and trends in order to provide more adequately for the varying needs of individuals.

When one looks back over the long perspective, an uneasy suspicion arises as to whether the fundamental educational concepts and procedures that characterized the work of some of the pioneer medical men who received their training and applied it to this new field so many years ago, may not have been more sharply focused on the individual student than the more highly specialized ideas and practices that are common to medical service and physical training in our own time.

Of course, there is no question that we know ever so much more than the earlier doctors did about many important aspects of the human animal, and the factors that influence his growth and development. They knew nothing about vitamins, allergies, conditioned reflexes, I.Q.'s, immunity, bacteria, etc.; whereas we know and use these and many other results of modern research in dealing with students. Still one wonders whether possibly they may not have had a clearer view of the forest than we who see so many trees; that is, that they had a better practical conception of the *biological unity and nature of the individual* than we who know so many more unrelated things about him.

Suppose we follow the example of President Stearns—make a critical study of our conditions of life—and list as a background for our thinking, some of the important changes that have taken place during the past fifty years or so, and that exert a powerful influence, favorable or unfavorable, on the fundamental processes concerned in “growing up” to a stable maturity:

1. During this period our expectancy of life has been increased by modern medicine and work in public health, by upwards of 50 per cent.
2. During the past forty years, the mortality rate in this country has decreased from 17.6 to 10.6 per thousand—the lowest in the history of any large country.
3. No great people in the history of the world has been on the average, better fed, clothed and housed than we have been in this country for many years.

4. At the same time, there has come about a very definite change in the pattern of family life, which combined with the multiplication of “gadgets”, motors, radio, movies, etc., have made us a pampered people, mechanically warmed, lighted, humidified, cooled, transported, amused, and lapped in an ease of living greater than even the Romans knew. As a result, while our youngsters are well grown and bigger than their parents and grandparents, they are softer and less rugged, not because the basic material is inferior—but because it has not been tempered by discipline and training, as shown by their greater susceptibility to joint injuries and muscle tears; and they are less hardy and stable emotionally, as shown by their increased susceptibility to personality problems.

5. Twice since 1917, we have had occasion to assess our manpower in the nation. Approximately 30 per cent of our young men were rejected in the selective service in the first World War for physical deficiencies; and of those accepted, there were many who *should have been rejected* because of personality weaknesses. Approximately 25,000 neuro-psychiatric cases are now in Federal hospitals. Now we are in the midst of another assessment of our manpower, and while accurate figures will not be available for many months, the indications are that there has been a definite change for the worse, ranging between 15 to 20 per cent, during the past twenty-four years.

This is a situation which exists in varying degrees throughout the country, and which has been counteracted to an almost negligible degree by the expansion of physical training and other facilities in about 75 per cent of the states since the last war.

These changes in the family life and in the modern culture pattern undoubtedly contribute to the increase in the number of persons who manifest characteristics that are, with others, commonly listed in this partial description of a “psychopathic personality.” “Their lives are governed to an unhealthy extent by primacy of short term values or the ‘pleasure principle’. As a result, the maturity and social adjustment which are to a considerable extent dependent upon the ability and the habit of subordinating momentary gratifications for more lasting values, are incompletely developed.”

There appears to be no valid reason for questioning the essential accuracy of this foregoing survey—and the conclusion that the factors listed exert a profound influence on the fundamental processes involved in the development of the individual.

If this premise be accepted, then it may be useful as a first step, to redefine one of our commonly used terms, i. e. “health”, and to analyze a certain important concept that is commonly misunderstood and is misleading, i. e. “Child’s Play.”

1. Would it not be helpful in our thinking if we considered “health as a condition that represents not alone absence of infectious and other types of physical disease, but connotes also the existence of

sound neuro-muscular development and a stable emotional nature as well as a recognition of the unfavorable effects of changes in our pattern of life? This should lead to a determined effort to devise a set of stimuli and a program of vigorous, purposeful activities suited to the individual of school age, that will compensate for those that have disappeared from the environment, to the end that the development to the limit of the nervous and mental powers of the individual, the control of his emotions, the growth of stability and hardiness, the knowledge of oneself and the ability to adjust one's own nature and possibilities, may be assured for every student.

2. "Child's Play." Just how this term came to be used as a synonym of aimless, useless activity is not clear to this writer, because as a matter of fact, the squirming, kicking, struggling child is responding to strong organic stimuli that call for a degree of concentration and a mobilization of physical powers that surpass anything that he can achieve in later life. Far from being *play*—it is *work* of the most intense and persistent type. To be sure—success in his effort brings great joy—but the *unseen* objective and results are progress in the development of neuro-muscular control and other equally important biological gains.

VI. THE BIOLOGY OF EDUCATION¹

This is an *educational problem*; it involves a consideration of the human animal as a whole, and the recognition of the biological fact that no sound development of structure, function, attitude or faculty can be acquired except by activity and experience due to the sequence of *strong stimulus, persistent effort in response, and final achievement* with the resulting happiness and satisfaction. The almost ceaseless activity of the individual—when not asleep—during infancy and childhood, is due to organic stimuli that are responsible for normal biological development of nerve and muscle—of persistence in spite of failures—of conditioned reflexes that are the basis of character, which Maudsley defines as *muscle habit*. Nothing is more striking in this situation than the child's intense concentration, his refusal to give up the effort, and the expression of joy and satisfaction that attend his success.

Activities in response to powerful stimuli—whether in childhood or, later in life, in training to develop some athletic technic—bring about results, some of which are *obvious*, such as increases in height, weight, strength, skills, and others that are *unseen*, such as the development

¹In this connection read Section II, "Development of the Mind," beginning on p. 32 of *Heredity and Environment*, sixth edition, 1930, by Prof. Edwin Grant Conklin.

of the neuro-muscular mechanism, the heart and the lungs, coordination, persistence and the habit of effort, which will in effect represent "conditioned reflexes".

This is education in its fundamental sense. What we tend to forget is that as the individual grows out of childhood, his continued development tends to depend more and more upon stimuli from his *environment*. If these stimuli are absent or unsuitable, due to cultural changes, normal development is correspondingly retarded or distorted.

There can be no question, that changes in family life tend to deprive children of the stimulus that under other conditions lead them to imitate father and mother, to accept responsibility, to finish the job at hand and to get satisfaction from success in taking another step in the process of growing up. But nowhere today, after childhood stimuli to periodic, persistent effort have played their part in the development of the individual—does the environment supply the stimuli and direction that are required to carry on the process of sound development through the maturation of the neuro-muscular system.

The effect of this deprivation is to retard the development of the biological possibilities of the individual, which is serious enough, but when you add to this handicap of *deprivation*, another set of *negative influences*, such as those noted in the preceding paragraphs, the formulation of a program of well devised, strongly stimulated activities suited to the needs and stage of development of the individual in various periods of his adolescence, assumes an importance that can not be measured.

The problem of counteracting these unfavorable influences in the lives of our children obviously can not be solved by patching up an educational philosophy and program that satisfied conditions characteristic of the nineteenth century. On the contrary, the situation calls for a scientific assessment of the whole social and cultural situation, and a reorientation toward the purpose and content of an educational program so that it will satisfy modern needs.

The members of this organization represent the only profession that requires in its training the study and understanding of the biology of the human animal. Also, you are the only group of medically trained men and women that devote all of their time and energies to matters that affect the welfare and education of our youngsters. Therefore, I suggest that you have, not only the *opportunity*, but the *responsibility*, to take the lead in studying this situation—with the help and advice of biologists, experts in physical activities and educators to the end that our children may, in the future, have the advantage of a well balanced physical, mental and emotional *education* and training.

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THE WISCONSIN CENTENNIAL

We congratulate the State Medical society of Wisconsin on the occasion of the 100th anniversary meeting to be held at Madison September 10, 11, and 12. This society was organized under the provisions of a bill enacted by the Wisconsin Territorial Legislature in 1841. It is a notable fact that the first session of the Wisconsin society preceded that of the American Medical Association by eight years.

Two men stand out in the annals of the State Medical society of Wisconsin for their long period of service. If our memory serves us rightly, Charles S. Sheldon of Madison held the office of secretary of the society for a greater number of years than any other man, and everyone must recognize the value of secretarial continuity in a growing organization of this kind. Sidney S. Hall of Ripon served contemporaneously as treasurer. Dr. Hall lived in Minneapolis with a daughter during

the last few years of his life, and he was a regular and welcome attendant at the weekly meetings of the Hennepin County Medical society, showing his continued interest in organized medicine to the very last.

Naturally, there may have been greater service in the aggregate rendered by members from the larger centers of population like Milwaukee and Madison, but the whole state has had a part in the building of the society and in promoting its success. We must not forget Evans of LaCrosse, Oviatt of Oshkosh, J. V. R. Lyman of Eau Claire, and John M. Dodd of Ashland. Frank W. Epley of New Richmond presided at the semi-centennial meeting featuring a unique public health and disease prevention program. Dr. Arveson of Frederic was chairman of a committee that made a comprehensive study of state medicine a few years ago, and the voluminous report has been regarded as one of the best in the nation. He served as president of the society last year.

Wisconsin has not only produced talent for the home state but has contributed to adjacent regions. Frank Billings used to delight in telling how he had to break the ice on the bucket in the attic of his Wisconsin farm home before washing on wintry mornings. He headed the department of medicine at Rush for many years as an outstanding teacher. Nicholas Senn, although a native of Switzerland, practiced first in Wisconsin and contributed to its medical history before he moved to Chicago to become the dramatic professor of surgery at Rush.

The State Medical society of Wisconsin has rounded out a century of great activity. Best wishes for another century of progress.

A. E. H.

MOTOR VEHICLE ACCIDENTS

Travel by automobile has greatly increased in this century. In 1895 there were only four automobiles manufactured in the United States but since that time there have been years when as many as 5,000,000 were manufactured. On December 31, 1939, there were registered in the United States 30,615,000 motor vehicles. The same year there were approximately 41,000,000 drivers of automobiles and the total number of miles traveled was about 270,000,000,000. There were in the United States in 1939, 32,500,000 families with a total population of 131,000,000. Approximately 70 per cent of all motor vehicles registered in the entire world are in the United States. In fact, there is in this country one automobile for every 4.3 persons but there is only one for every 150 persons in other parts of the world. Of the various causes of accidental death, motor vehicles lead; indeed, in 1939 they were responsible for 35 per cent of all such deaths, killing a total of 32,600 persons; in fact, a person died every sixteen minutes throughout the year from automobile accidents. The number of deaths was two and one-half times those caused by syphilis, equal to those caused by diabetes, and one-half of those caused by tuberculosis. More children were killed by traffic accidents in 1939 than died from diphtheria, measles, scarlet fever, and whooping cough combined. Besides the fatalities, 1,150,000 other persons were injured. Of every five who died in traffic accidents, two were pedestrians.

Some of the causes of traffic accidents are: 1. *Unsafe speed*. 2. *Improper driving* exclusive of speed, such as violating right-of-way and driving on the wrong side of the road. 3. *Unsafe acts* of pedestrians; in fact, two of every three pedestrians killed in 1939 were violating a traffic law or practicing unsafe acts at the time of death. 4. *Alcoholic drinks* had been taken by either pedestrian or driver shortly before one in every four accidents occurred. 5. *Physical defects*, including loss of sleep and fatigue, are the cause of many accidents and it is believed that numerous other mishaps are due to defective vision, hearing, etc., which could be avoided if every driver was compelled to be examined as carefully as railroads and airlines require for their engineers and pilots. 6. *Age of Drivers*. The highest accident rate

occurs among drivers under the age of twenty years, probably due in part to inexperience and poor judgment. After twenty, there is a steady decrease in the accident rate until the age of fifty, when it rises sharply. In this older age period such factors as impairment of vision and slow reaction time must play considerable role. 7. *Bicyclists*. During the past six years the number of bicycles in use in this country has nearly tripled. The bicycle has been a serious hazard on the highways partially because the riders have not been required to display lights and also because they take chances almost as freely as pedestrians; in fact, three in every four persons who were killed on bicycles in 1939 were violating traffic laws and one in every four was riding a defective bicycle. 8. *Defective Vehicles*. Nine per cent of fatal accidents were involved with defective vehicles and it is probable that the true percentage is higher because investigations following an accident are not always sufficiently complete or the destruction of the vehicle is so great as to prevent the finding of the former defect. Obstruction of view, by rain, snow, and ice on windshields, fog, signs, embankments, trees, etc., along the highways account for many accidents. *Night driving*. Because of the darkness and the glare of lights of approaching cars night driving is especially hazardous. Indeed, the fatal accident rate per mile of travel is three times as high during the night as in daylight. Among pedestrians more than one-half of all fatalities occur between 6 P. M. and midnight, yet there is only one-third as much motor vehicle traffic at night as during the day. The severity of accidents is also greater at night. *Excessive speed, right-of-way* in cities, and *wrong-side of the road* in the country account for many fatal accidents.

The most dangerous method of travel is by motor vehicle. Of the 270,000,000,000 miles traveled in 1939, 12.1 persons died every 100,000,000 miles. However, in 1929 17.3 persons died for every 100,000,000 miles traveled. Passenger cars in 1939 alone resulted in the deaths of 29,500 persons and 1,020,000 non-fatal injuries; trucks took the lives of 6,900 persons and injured 150,000 others; buses killed 400 and injured 15,000 persons; motorcycles killed 700 and injured 15,000. The decrease in accidents involving buses is remarkable; there was a drop of 50 per cent between 1927 and 1939.

The property damage alone due to motor vehicle accidents in 1939 amounted to more than \$1,000,000,000 and almost 10,000,000 automobile drivers damaged cars of others or their own. One-half million drivers were involved in accidents which brought death or injury to others. The direct cost of automobile accidents in 1939 amounted to \$3,300,000,000. This included overhead cost of insurance for accidental injuries, wage losses, medical expense, and property damage.

The medical profession may assist considerably in preventing accidents by taking an active part in accident prevention week and making this an important topic of conversation throughout the year. Information such as that presented here is available through the office of the National Safety Council, 20 North Wacker Drive, Chicago.

J. A. M.

TRANSACTIONS OF
THE MINNEAPOLIS ACADEMY OF MEDICINE
(Minneapolis Clinical Club)

Founded January 17, 1920

Stated Meeting Held at the Minneapolis Club, Thursday, March 13, 1941

The President, Lawrence R. Boies, M.D., in the Chair

INTESTINAL OBSTRUCTION DUE TO
GALLSTONES

Diagnosis by Roentgen Examination

CHAUNCEY N. BORMAN, M.D.

Inaugural Paper

ABSTRACT

The importance of the recognition of the exact nature of an obstructing lesion of the bowel in relationship to the treatment and the mortality rate has been discussed.

The incidence, etiology, pathogenesis, clinical characteristics, and the roentgen diagnosis of intestinal obstruction due to gallstones have been described.

The roentgenologic literature, to date, has been reviewed.

Seven cases of intestinal obstruction due to gallstones diagnosed by roentgen examination were presented. In all seven cases air in the biliary system was demonstrable.

Four patients recovered after surgical removal of the stone.

Two patients died after surgical removal, one of which was the result of a gas bacillus wound infection.

One patient was considered inoperable upon admission.

1. The diagnosis of intestinal obstruction due to gallstones is possible in a high percentage of cases by roentgen examination.

2. Air in the biliary tract associated with intestinal obstruction is the most consistent and reliable roentgen sign.

3. Visualization of the gallstone in the intestine or a change in the position of stones are less constant findings.

4. Immediate surgical removal of the stone in the absence of contraindications is almost always indicated. A lowering of the high mortality rate is to be expected since an early and exact diagnosis permits early surgical intervention.

DISCUSSION

Dr. LEO G. RIGLER: This is a very interesting subject to me. Changing concepts of surgical procedures stimulate us to change our concepts of the value of certain diagnostic procedures. There was a time when an acute abdominal condition was an indication for intervention, regardless of the source. It was not then so important as now to get an absolutely clear elucidation of what was taking place in the abdomen, although it was of considerable value to the surgeon to have some clear notion of what was going on if he were going to explore.

Today, particularly because of the introduction of two procedures, the conservative treatment of intestinal obstruction and the conservative treatment of peritonitis, it is more important that we have a definite concept. I do not know of any clinical condition that seems to defy diagnosis as frequently as gallstone obstruction. It would be interesting to relate many case histories to illustrate the extreme difficulties which one encounters in this condition.

Some years ago we saw an old lady who was a sort of an annoyance because she was constantly coming in with different complaints. Following a minor injury she was hospitalized for four or five days, but no one found anything wrong with her so they were about to discharge her when she insisted she had peritonitis. The staff was inclined to laugh at it but finally thought it would be a good idea to give her a barium enema and see whether there was anything in her colon to give her this pain and feeling of distension.

The intestine was found to be rather distended but still not realizing what we had, a barium meal was given and we found

a gallstone obstruction. The stone was removed and she recovered. This patient was in the hospital under observation for five days with a gallstone obstruction and no clinician realized it at all.

I want to emphasize again that it is not necessary to give barium. It is, in fact, a reprehensible thing to do under such circumstances. We did it in one or two cases, but largely in error. If one good film of the abdomen is made, the diagnosis can be made without barium.

I would like to show you one film sent me by one of my friends, Dr. Warren Furey of Chicago, because it illustrates well the importance of simple films of the abdomen and the negative as well as the positive information which can thus be furnished. This woman was about 70 and in with the complaint of nausea and vomiting. She had some distension and the question arose as to the presence of intestinal obstruction. On the film examination you can see the characteristic loops of bowel, widely distended. There was no history of a previous operation, no history of peritonitis, no evidence of hernia, so that they were puzzled about the source of this obstruction. There is also no evidence in the roentgenogram of gas in the biliary tract so that gallstone obstruction seemed unlikely. If the obstetricians will look closely at the film they will be interested in a little mass on the right side which looks like a part of a fetal skeleton. On close questioning, however, they discovered that in the part of the country where this woman came from, the people took the feet of chickens, scrubbed and skinned them, boiled them and chewed them up. She had lost her teeth so she couldn't chew. The obstructive mass was a group of chicken bones which had formed a bezoar. So we have here another type of obstruction similar in certain respects to gallstone obstruction, but much more rare.

Dr. RUSSELL W. MORSE: I wish to congratulate Dr. Borman on this very excellent presentation. He has covered the subject very thoroughly. There is little to add as regards diagnosis of this condition.

I do feel, however, that conservative treatment in intestinal obstruction is justified in relatively few instances. When intestinal obstruction comes on shortly after laparotomy I think we are justified in using conservative treatment. When intestinal obstruction comes on in an elderly person on whom operation is almost invariably sure to lead to fatality we are justified in temporizing. In instances where intestinal obstruction occurs in a patient who is a good operative risk, I do not think that one should procrastinate unless it is necessary to prepare the patient for safe surgery. I cannot agree with letting a case go four or five days without operation in the presence of intestinal obstruction when the patient is a good operative risk.

I would like the pathologist to answer a question. Occasionally a whole group of gallstones will cling together as a mass and produce obstruction in the intestinal tract. Are these stones held together by thick mucus or are they held together by a covering of mucous membrane of the gallbladder?

Again I wish to thank Dr. Borman for this interesting and thorough presentation.

Dr. MALCOLM B. HANSON: Dr. Borman is to be congratulated for his excellent presentation. For many years I have advocated the routine use of flat films of the abdomen before the ingestion of a barium meal or the administration of a barium enema. It is interesting to see the number of obscure and unsuspected pathological conditions which this method reveals.

Dr. ORWOOD J. CAMPBELL: I had an experience which indicates that under certain circumstances the diagnosis can be established without the use of X-ray films. About one and one-half years ago I was called away from Minneapolis to see an elderly woman with very typical small bowel obstruction. She also gave a very characteristic history of gallbladder colic extending back two or three years. Following her recent attack of gallbladder pain, the small bowel obstruction had developed and was characterized by intermittent attacks of vomiting, distention and colicky pain.

The diagnosis of small bowel obstruction due to a gallstone was made, and on operation a gallstone was found in the lower part of the ileum. It measured between 3 and 4 cm. It was easily removed and the patient had an uneventful convalescence.

A diagnostic method suggests itself where obstruction due to gallstones is suspected. Would it not be reasonable to pass a Miller-Abbott tube down to the point of obstruction and then to inject a small amount of opaque media? This ought to outline the gallstone and make it readily visualized on X-ray.

Dr. J. S. McCARTNEY: The first instance of gallstone obstruction I ever saw was a woman who was operated on, the type of obstruction not being recognized. At laparotomy they felt this small mass at the terminal ileum and thought it was a carcinoma and backed out. It turned out to be a stone about 3 cm. in diameter and 5 to 6 cm. in length.

In the few instances that we have had the point of obstruction is usually the terminal ileum as indicated by Dr. Borman. Apparently they do not stick higher up. It usually is a solitary stone and olive-shaped. Occasionally, faceted stones seem to be stuck together by bits of mucus. I do not recall having any instance in our postmortems where an obstruction has been due to faceted stones.

I enjoyed Dr. Borman's paper very much.

Dr. R. C. WEBB: I have been very much interested in this very valuable contribution which is providing useful assistance to the surgeons. I reported a case of gallstone ileus with recovery in 1927, and I learned at that time that the mortality in this disease was around 65 per cent. Since then I have seen two other cases, one of my own and one in consultation, both of whom died.

My first case was a 67-year-old woman who was first seen by a physician six days before I saw her. She was operated upon on the day of admission to the hospital, six days after onset of symptoms and the obstructing gallstone was easily found and was removed. She was given frequent gastric lavages post-operatively as we were not using nasal suction at that time. She made a complete recovery.

The second case was a man who had been advised to have his gallstones removed six months previous to his attack of obstruction and it was known that he had large stones. This man presented himself late in the disease and was operated upon and did not survive.

The third case was the physician mentioned by Dr. Rigler whom I saw in consultation. He was diagnosed as an intestinal obstruction by the doctors in his home town. Operation was urged, but the patient demurred. He came to Minneapolis and after three weeks of nasal suction, intravenous treatment and numerous consultations, he finally submitted to operation and almost immediately succumbed. This man was quite obese, and although he had an extensive X-ray study during his pre-operative treatment, a gallstone causing the ileus was neither seen nor suspected.

When we have a patient with a large gallstone shown in the gallbladder X-ray we must keep in mind the possibility of this stone ulcerating through the wall of the gallbladder into an adherent duodenum and passing down through the small intestine and causing gallstone ileus. Gallstone ileus should be kept in mind when we have a patient with intestinal obstruction with no scars on the abdomen, with no obvious signs of abdominal carcinoma and especially if there is a history of gallbladder disturbances. The presence of a gallstone obstruct-

ing the ileum should be searched for in the X-ray. A gallstone lodged in the small intestine causing obstruction will eventually cause damage to the wall of the intestine, and so it is desirable not to defer operation too long. If a gallstone as a cause of the ileus can be proven by X-ray, the problems of surgical judgment are considerably simplified, and we have but to obtain the optimum in preoperative care and then operate.

I enjoyed Dr. Borman's paper very much, and I am sure that this additional diagnostic procedure will help to provide earlier diagnosis and treatment in gallstone ileus.

Dr. THOS. J. KINSELLA: I enjoyed this presentation very much. I should like to ask Dr. Borman about the relative incidence of perforation of gallstones into the colon rather than into the duodenum. I ask this because of a patient whom I saw recently who developed obstruction of a colostomy stoma from a gallstone which was well over 3 centimeters in diameter. Certainly this was too large to have passed through the terminal ileum and there was no antecedent history suggestive of the passage of an object this large through the intestine.

Dr. E. C. HENRIKSON (by invitation): Along this line, about three years ago a patient telephoned me about her 78-year-old mother, stating that she had a severe diarrhea. There was an epidemic of diarrhea at that time, and, thinking it was the ordinary type, I gave her directions as to how to treat it. About four days later she again telephoned me. She was very excited about a strange object that her mother had just passed per rectum. I requested that she bring it to my office. She did so and on examination it looked like a pine-board knot, 1½ inches in diameter, wedge-shaped as though it had been sawed at an angle. I told the daughter that it looked like a piece of wood but didn't know how it got up in the rectum! She went home and about an hour later called again asking that I hurry over because of her mother's extreme distress. She was passing another similar larger object. I could hear her groaning as I talked to the daughter. I rushed over but by the time I arrived it was all over. The daughter had taken a pair of pliers and delivered the object just before I got there. Then the old lady passed a third but smaller object. When placed together the three pieces took the shape of a gallbladder and measured about 4 x 1½ inches. The patient made an uneventful recovery.

These stones could not have passed through the small bowel without causing obstruction. They must have sloughed through the fundus of the gallbladder into the colon. Her diarrhea was probably just part of the reaction during the process.

Dr. CHAUNCEY N. BORMAN (closing discussion): In regard to Dr. Campbell's suggestion concerning passage of a Miller-Abbott tube with injection of barium to localize a gallstone, I might say that in certain instances this procedure may be an ingenious one. However, one must almost be an expert in tube-passing if he is to do so efficiently in all cases. Dr. James Lofstrom of Detroit, Michigan, who has had an extensive experience with these tubes, tells me that it usually requires two or three months training for any one individual before he becomes proficient in tube insertion. Aside from the difficulties that may be expected in passing the tube, I see no objection to its use.

In answer to Dr. Kinsella's question, fistulae between the gallbladder and colon occur in about 25 per cent of all cases of internal biliary fistula. Bowel obstruction resulting from passage of a stone directly into the colon is quite rare; most of these stones pass spontaneously. Probably most relatively large stones that are passed spontaneously per rectum are those that have entered the colon directly.

I wish to thank the discussants for their remarks and for their interest in the material presented.

"The Sex Steroid Family," by Edwin C. Hemblen, M.D., associate professor of obstetrics and gynecology, Duke University School of Medicine, was also presented at this meeting. It will be published in the October JOURNAL-LANCET.

ERNEST R. ANDERSON, M.D., Secretary.

REPORT ON ENCEPHALITIS EPIDEMIC

The total number of encephalitis cases in the state of Minnesota to date (August 28) is 706. The first case was reported June 24, the second June 25. The remaining cases occurred during July and August. There have been 55 deaths reported.

The present type of encephalitis differs from the type that was seen in the winter and spring months of the early 1920's. The present disease has been seen chiefly in rural areas. The onset is usually fairly sudden with severe headache, and fever—there may be vomiting. Within a day or two patient feels sick enough to stay in bed and the main symptom is marked drowsiness. This may alternate with restlessness. At this time the patient frequently has a moderate stiff neck and may have tremors about the mouth and of the hands. The fever usually varies from 103° to 105°; the deep reflexes vary. Spinal fluid is clear and the cell count varies from about 30 to several hundred. The acute illness usually lasts ten days to two weeks and convalescence is usually marked by weakness.

The Minnesota State Department of Health, Division of Preventable Diseases, is very much interested in making an etiologic diagnosis and when a case is reported it is requested that a sample of sterile whole blood (minimum of 10 cc.), taken as early in the disease as possible, be submitted and that one later during the second or third week of illness be also sent in. Neutralization tests are run with these sera using the Western strain of encephalomyelitis virus and the St. Louis type of virus. These tests are run using mice, and it takes from 10 to 14 days to run a test. Owing to our limited staff it has been impossible to run a great number of sera promptly. However, every serum is being run in the order in which it is received and eventually the physician will receive a report on every serum sent in. It is hoped that the physicians will continue to send in sera although there may be a delay, sometimes as much as one month, in receiving a report.

It is also desired that brain specimens on fatal cases be submitted whenever possible. The basal nuclei and brain stem are the parts of the brain desired. Such specimens should be preserved in 50 per cent glycerine, preferably diluted with Locke's solution or with nutrient broth. The jar should be packed in ice during transit to the laboratories. On request to the Division of Preventable Diseases a pathologist will be sent to perform the autopsy as far as it is possible to do so.

Many requests are received with respect to treatment. There is no specific treatment for acute encephalitis and general supportive treatment has been given. There is no vaccine available for general use at the present time.

The same quarantine regulations have been applied here as in the ordinary winter type of encephalitis. The positive neutralization tests that have been obtained up to the present time indicate the presence of the Western type of equine encephalomyelitis virus. The spread of this infection is thought to be by means of insect vectors such as the mosquito, but until the manner of spread in this disease has been conclusively worked out, it is

thought best to impose restrictions as mentioned above. Many cases are being cared for in private rooms in general hospitals, surgical technic being carried out.

All reports of frank and suspected cases and all specimens should be sent to the DIVISION OF PREVENTABLE DISEASES, MINNESOTA DEPARTMENT OF HEALTH, UNIVERSITY CAMPUS, MINNEAPOLIS.

The following treatment has been suggested by J. C. McKinley, Professor of Neuropsychiatry, and A. B. Baker, Associate Professor of Neuropsychiatry, University of Minnesota Medical School, Minneapolis.

There is no specific treatment for encephalitis; the present treatment is primarily supportive and symptomatic. These are, however, very important since they add comfort to the patient and often help tide him over the more acute phases of the illness. The following are some of the more important procedures that should be instituted in these cases:

1. *Rest.* Bed rest should be immediate and complete. It should be maintained for a sufficient length of time to allow for complete recovery. Even in light cases without complications and of only a few days of acute illness, a week in bed is a minimum for convalescence.

2. *Skin.* The skin should be kept clean and sponged frequently with alcohol. If involuntary urination or defecation occurs, the skin should be cleaned, carefully dried and powdered. The danger of decubitus is thus minimized.

3. *Bowels and Bladder.* If the bladder is distended, the patient should be catheterized at least twice daily under careful sterile conditions. Cystitis is always a possible complication to be kept in mind. Bowels should be kept open with daily tap water enemas or a mild laxative. Daily bowel movements are not necessary.

4. *Food.* Food in the form of a soft or liquid diet should be given liberally at frequent intervals. Patients should not be allowed to go more than 24 hours without food. If there is difficulty in swallowing, liquid food may be given. These liquids should be given in small amounts (50 cc.) at very frequent intervals (every half hour). If patient cannot swallow even liquids or if he is comatose, he should be fed preferably by stomach tube or if that produces too much disturbance of the patient, by intravenous methods.

(a). Intravenous feedings should consist of 1,000 cc. of 5 per cent glucose given twice daily. The solution and apparatus must be sterile and doctor or nurse must be present throughout the administration, which should extend over hours.

(b). Tube feeding. This is the preferable method of feeding. A duodenal tube is sterilized. The end of the small tube is moistened with glycerine or water, the tube is passed through the nostril and is pressed backward and downward into the esophagus. One must be sure that the tube is in the stomach and not in the trachea. If in the latter, the patient often becomes cyanotic and air escapes from the funnel at the end of the tube. It is wise to pass a little water into the tube before beginning the feeding. If tube is in the air passages, the water will produce coughing, or in less responsive patients, some

alterations in respiration or even a little cyanosis. After the tube has been inserted into the stomach, the liquid foods are administered slowly, about 250 to 500 cc. per feeding. The feedings are given twice daily. The tube may be inserted at each feeding, or the tube may be left in place, the end of the tube being fixed to the side of the face with a small piece of adhesive. Medications can be administered at the time of tube feedings, and even between feedings if a small quantity of water is used to wash them into the stomach. The tube feeding formula on use at the University Hospital for such cases is as follows:

- 2 eggs
- 1/4 cup sugar
- 2/3 cup 25% cream
- 2 cups milk
- 2/3 cup malted milk powder
- 2 squares butter

This makes approximately 1500 calories in 1000 cc. material.

5. If patient is excited, anxious and unable to sleep, mild sedation often helps reduce irritability. Bromides and the barbiturates are the best drugs in such cases. Sometimes lumbar puncture with lessening of spinal fluid pressure reduces the irritability; it may be repeated daily for a few days if irritability and excitement recur. This is most likely to succeed in those patients with severe headache or pronounced evidences of meningeal involvement (strongly positive rigidity on anteroflexion of neck and Kernig's sign).

6. Somnolent and comatose patients should be moved from side to side at frequent intervals (three or four times daily) in order to prevent pulmonary congestion and hypostatic pneumonia.

A. J. CHESLEY, M.D.,
 Secretary and Executive Officer,
 Minnesota State Department of Health.

News Items

University of Minnesota Medical School News

Dr. Clarence M. Jackson, Professor and Head of the Department of Anatomy, retired at the close of the school year and has been appointed Professor Emeritus in the Department of Anatomy. A committee consisting of the following professors has been appointed to administer the department for the coming year: Dr. Edward A. Boyden, chairman, Dr. Andrew T. Rasmussen, and Dr. Hal Downey.

The following members of the faculty retired at the close of the school year: Dr. J. Frank Corbett as Clinical Professor of Surgery; Dr. Harry P. Ritchie as Clinical Professor of Surgery; Dr. Walter R. Ramsey as Clinical Associate Professor of Pediatrics; Dr. Orianna McDaniel as Clinical Associate Professor of Preventive Medicine and Public Health; and Dr. Anton G. Wethall as Clinical Assistant Professor of Urology.

In addition, Dr. Horace Newhart, Professor of Otolaryngology and Director of the Division of Otolaryngology, Rhinology and Laryngology; and Dr. Charles A. Reed, Associate Professor of Orthopedic Surgery, resigned from the medical faculty, after many years of service, to devote their time to private practice.

The following promotions have been made: Dr. C. D. Creevy to Professor of Surgery, Chief of the Division of Urology, and Assistant Dean of Medical School; and Dr. James A. Johnson to Clinical Professor of Surgery.

To Associate Professor: Dr. Abe B. Baker, Associate Professor of Nervous and Mental Diseases and of Pathology; Dr. John R. Paine, Associate Professor of Surgery; and Dr. Wesley W. Spink, Associate Professor of Medicine.

To Clinical Associate Professor: Dr. Archibald H. Beard, Clinical Associate Professor of Medicine; Dr. Edward T. Evans, Clinical Associate Professor of Surgery; Dr. Royal C. Gray, Clinical Associate Professor of Nervous and Mental Diseases; Dr. Nathaniel H. Lufkin, Clinical Associate Professor of Pathology; Dr. Kenneth A. Phelps, Clinical Associate Professor of Otolaryngology; Dr. Morse J. Shapiro, Clinical Associate Professor of Medicine; Dr. Samuel A. Weisman, Clinical Associate Professor of Medicine.

Dr. Lawrence R. Boies, Clinical Associate Professor of Ophthalmology and Otolaryngology, has been appointed Director of the Division of Otolaryngology.

To Assistant Professor: Dr. Lillian Cottrell, Assistant Professor of Nervous and Mental Diseases; and Dr. Charles E. McLennan, Assistant Professor of Obstetrics and Gynecology.

To Clinical Assistant Professor: Dr. John M. Adams, Clinical Assistant Professor of Pediatrics; Dr. Frank C. Andrus, Clinical Assistant Professor of Pathology; Dr. Joseph F. Borg, Clinical Assistant Professor of Medicine; Dr. George K. Higgins, Clinical Assistant Professor of Pathology; Dr. John J. Hochfilzer, Clinical Assistant Professor of Otolaryngology; Dr. Ernest L. Meland, Clinical Assistant Professor of Urology; Dr. Johannes K. Moen, Clinical Assistant Professor of Medicine; Dr. Russell W. Morse, Clinical Assistant Professor of Radiology; Dr. Harold O. Peterson, Clinical Assistant Professor of Radiology; Dr. Wallace P. Ritchie, Clinical Assistant Professor of Surgery; and Dr. Ragnvald S. Ylvisaker, Clinical Assistant Professor of Medicine.

Dr. Chester A. Stewart resigned his appointment July 1 as Clinical Professor of Pediatrics to accept an appointment as Professor and Head of Pediatrics at the Louisiana State University School of Medicine.

Dr. Arthur G. Sullivan, Madison, Wisconsin, has assumed the post of acting Managing Director of the Inter-State Post Graduate Medical Association of North America. Dr. Sullivan has been Director of Exhibits for many years and lately had been taking over much of the work of the former Managing Director, Dr. Peck. Under his direction, future projects of the Inter-State Post Graduate Medical Association will proceed as usual. He will carry out the plans made by Dr. Peck for the Minneapolis meeting in October.

Dr. Charles J. Beck has become associated in general practice with Dr. A. F. Hammargren of Harvey, North Dakota. Dr. Beck is a graduate of the University of Minnesota and has recently completed his internship at the Murray Hospital in Butte, Montana.

Dr. A. A. McGill of Omaha has become associated with Dr. W. E. Lacey, Havre, Montana. He takes the place of Dr. F. W. Aubin who is now at Fort Ord, California.

A series of health conferences for infants and pre-school children was held throughout Grand Forks county (North Dakota) August 1 to 16. The division of maternal and child hygiene, state department of health, conducted the clinic.

Dr. Philips C. Welton is the new superintendent of Buena Vista sanatorium. He succeeds Dr. R. R. Hendrickson who resigned to become superintendent of Lake Park sanatorium. Dr. Welton spent the past year in Salt Lake City where he was deputy health officer for the state of Utah.

Dr. George W. Drexler, Alexandria, Minnesota, is now a member of the staff of the Long Prairie hospital.

The forty-sixth annual meeting of the American Academy of Ophthalmology and Otolaryngology will be held at the Palmer House, Chicago, October 19-23, under the presidency of Dr. Frank R. Spencer, Boulder, Colorado. The academy's program consists of one general scientific meeting on the morning of the first day, separate programs for the two specialties on alternate afternoons and instructional courses every morning beginning on Tuesday. The feature of this year's general opening meeting will be a symposium on vertigo, with Dr. Francis H. Adler, Philadelphia, representing ophthalmology; Dr. William J. McNally, Montreal, otolaryngology, and Dr. Bernard Alpers, Philadelphia, neurology.

Dr. E. W. Humphrey, veteran Moorhead physician and recent mayor, has been named a fellow in the International College of Surgeons.

Dr. Larry Young, who was resident physician at a CCC camp in Lewistown, Montana, the past year, is now taking postgraduate work at the University of Chicago.

Dr. James Shandorf, former resident physician at Minneapolis General hospital, is now in New York City where he has a year's fellowship in obstetrics and gynecology at the Lying-In hospital. He was graduated from the University of Minnesota in 1936, served his internship at the Minneapolis General hospital and had a teaching fellowship at the University hospital.

Dr. L. H. Fancher, who recently resigned as superintendent of Sand Beach sanatorium, has been awarded a scholarship from the U. S. Public Health service and the state board of health. He will study at the University of Minnesota for a master's degree in public health.

Dr. Frank W. Scott, manager of the veterans' hospital at Reno, Nevada, has succeeded Dr. A. E. Morgan as chief medical officer of the Fort Harrison hospital, Helena, Montana.

Dr. Lester Breslow has been appointed district health officer under the state board of health in Rochester, Minnesota, to succeed Dr. F. M. Feldman. Dr. Breslow formerly was associated with the division of preventable diseases of the Minnesota state board of health.

Dr. Lloyd W. Gilman, formerly of Atwater, Minnesota, who was called into Army service several months ago, is now at Fort Ord, California, attached to the 57th medical battalion, with the rank of lieutenant.

Dr. Lloyd T. Sussex, Havre, Montana, was made a fellow of the International College of Surgeons at the meeting of the College in Mexico City last month.

Dr. C. W. Jacobson has joined the staff of the Bratrud Clinic in Thief River Falls, Minnesota. He recently completed his internship at Ancker hospital, St. Paul.

Dr. K. A. Tyler, Boulder, Montana, is now in Galen where he has accepted a position at the Montana state hospital.

Dr. Henry E. Rokala, Biwabik, Minnesota, has taken over the practice of Dr. S. P. McDaniel in Virginia.

Dr. E. A. Heiberg, Fergus Falls, was recently elected president of the Northern Minnesota Medical association. Other officers include Dr. R. N. Jones, St. Cloud, vice president, and Dr. Clarence Jacobson, Chisholm, secretary-treasurer.

Dr. D. E. McBroom, superintendent of the Minnesota Colony for Epileptics at Cambridge, Minnesota, has been appointed director of a program of mental hygiene and mental testing in the state division of public institutions. Dr. Royal C. Gray of Minneapolis, who since 1938 has served as psychiatrist of state penal institutions, will succeed him as acting superintendent.

Neurology

Dr. William Buckley Peck, 70, Managing Director of the Inter-State Postgraduate Medical Association of North America, died at his home in Freeport, Illinois, August 20, 1941, after a brief illness. Dr. Peck had organized and directed postgraduate clinics in various countries throughout the world. He was one of the organizers of the Tri-State Medical society (composed of Illinois, Wisconsin and Iowa) which later was expanded to include Indiana, Missouri and Montana and finally became the Inter-State Postgraduate Medical Association which includes all United States and Canada. Dr. Peck gave up his medical practice to become Director of the association.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
ON JULY 11, 1941
JUNE EXAMINATION

Name	School	Address
Anderson, Richard Audrey	U. of Minn., M.B. 1940, M.D. 1941	2914 Newton Ave. N., Minneapolis, Minn.
Ausman, Duane Robert	U. of Minn., M.B. 1941	Sacred Heart Hospital, Spokane, Wash.
Bateman, James Gordon	U. of Minn., M.B. 1941	Alameda Co. Hospital, Oakland, Calif.
Bowers, Gordon Gill	U. of Minn., M.B. 1940, M.D. 1941	444 Newton Ave. S., Minneapolis, Minn.
Brown, Frank Jerome	Marquette U., M.D. 1941	235 W. Spring St., Chippewa Falls, Wis.
Bryan, Donald Irvin	U. of Minn., M.B. 1941	Wm. J. Seymour Hospital, Eloise, Mich.
Caldwell, Hayes W.	Med. Col. of Va., M.D. 1938	Mayo Clinic, Rochester, Minn.
Carlson, Norman Carl	U. of Minn., M.B. 1941	Gillette Hospital, St. Paul, Minn.
Clarke, Edward Treadwell	U. of Texas, M.D. 1939	Mayo Clinic, Rochester, Minn.
Conklin, Roscoe Edward	U. of Colo., M.D. 1935	Mpls. General Hospital, Minneapolis, Minn.
Conway, John Edward	U. of Wis., M.D. 1940	Ancker Hospital, St. Paul, Minn.
Cundy, Donald Thomas	U. of Minn., M.B. 1941	Ancker Hospital, St. Paul, Minn.
Dailey, Walter Charles	Rush Med. Col., M.D. 1939	East Grand Forks, Minn.
Demong, Charles Vincent	Syracuse U., M.D. 1938	Mayo Clinic, Rochester, Minn.
Drake, Emerson Hadley	Columbia U., M.D. 1941	St. Luke's Hospital, Morningside Heights, New York City, N. Y.
Egan, Sherman	Northwestern, M.B. 1939, M.D. 1940	Mayo Clinic, Rochester, Minn.
Evans, Charles Howard, Jr.	McGill U., M.D. 1937	Mayo Clinic, Rochester, Minn.
Fox, William Richard	U. of Manitoba, M.D. 1941	Rugby, N. D.
Fulton, Alfred Miller, Jr.	U. of Minn., M.B. 1940	Northwest Clinic, Minot, N. D.
Gates, Wright Addison	U. of Minn., M.B. 1940, M.D. 1941	425—6th St. S.E., Minneapolis, Minn.
Grotting, John Kolben	U. of Minn., M.B. 1941	Detroit Receiving Hospital, Detroit, Mich.
Halper, Bernard	U. of Minn., M.B. 1941	Wayne Co. Hospital, Eloise, Mich.
Henslin, Merrill Edgar	U. of Minn., M.B. 1941	The California Hospital, Los Angeles, Calif.
Heyerman, Oscar T.	Northwestern, M.B. 1940, M.D. 1941	Northwestern Hospital, Minneapolis, Minn.
Hogan, Clifford William	U. of Minn., M.B. 1939, M.D. 1940	Kensington, Minn.
Howe, Newell Willard	U. of Minn., M.B. 1941	Milwaukee Co. Hospital, Wauwatosa, Wis.
Ingalls, Edgar George, Jr.	U. of Minn., M.B. 1941	Jersey City Medical Center, Jersey City, N. J.
Iverson, Herman Alexander	Johns Hopkins, M.D. 1941	Johns Hopkins Hospital, Baltimore, Md.
Johnson, Roger Harry	U. of Wis., M.D. 1939	Mayo Clinic, Rochester, Minn.
Kaasa, Laurin Juul	U. of Minn., M.B. 1941	Ancker Hospital, St. Paul, Minn.
Kendall, Rodney Frederick	U. of Minn., M.B. 1941	St. Mary's Hospital, Duluth, Minn.
King, John Robert	U. of Minn., M.B. 1941	Westfield, Mass.
Knight, Edwin Graham	U. of Minn., M.B. 1939, M.D. 1940	Randall, Minn.
Lampe, Margaret Ruth	U. of Minn., M.B. 1941	Tyler, Minn.
Lindeke, Harold Irving	U. of Minn., M.B. 1941	Medical Center, Jersey City, N. J.
Love, Robert Campbell	U. of Minn., M.B. 1939, M.D. 1940	Glenwood City, Wis.
McCaffrey, Fabian John, Jr.	U. of Minn., M.B. 1940, M.D. 1941	2749 Stevens Ave., Minneapolis, Minn.
McGroarty, Brian John	U. of Minn., M.B. 1940, M.D., 1940	Easton, Minn.
McNairy, Donald J.	U. of Louisville, M.D. 1939	Mayo Clinic, Rochester, Minn.
Moehn, John Thomas	Creighton, M.D. 1941	Ancker Hospital, St. Paul, Minn.
Moore, Orville Morris	U. of Neb., M.D. 1938	225 W. 5th St., York, Neb.
Musgrove, James Edward	U. of Manitoba, M.D. 1939	Mayo Clinic, Rochester, Minn.
Nelson, Carleton Alexander	U. of Minn., M.B. 1941	Mpls. General Hospital, Minneapolis, Minn.
Olsen, Ralph Lormar	U. of Minn., M.B. 1941	856 University Ave., St. Paul, Minn.
Peterson, John William	U. of Minn., M.B. 1941	Kings Co. Hospital, Brooklyn, N. Y.
Pumala, Erven Enzo	U. of Minn., M.B. 1940, M.D. 1941	St. Barnabas Hospital, Minneapolis, Minn.
Ravits, Harold G.	U. of Minn., M.B. 1941	Wayne Co. Hospital, Eloise, Mich.
Rosenow, John Henry	Harvard, M.D., 1938	Mayo Clinic, Rochester, Minn.
Sloan, Benjamin C.	U. of Minn., M.B. 1941	Gen. Hosp. of Fresno County, Fresno, Calif.
Steiger, Elmer Edward	U. of Wis., M.D. 1940	Nopeming, Minn.
Strauss, Eugene Cecil	Hahnemann, Phila., M.D. 1940	Grand Marais, Minn.
Tenen, Max Marcus	U. of Minn., M.B. 1941	2301 Oak Park Ave. N., Minneapolis, Minn.
Tudor, Richard Beresford	U. of Minn., M.B. 1941	Duke Hospital, Durham, N. Car.
Thill, Leonard Joseph	Marquette, M.D. 1941	Fennimore, Wis.
Vaudreuil, William Francis	U. of Wis., M.D. 1940	Miller Hospital, Duluth, Minn.
Watson, Richard Edward	U. of Minn., M.B. 1940, M.D. 1941	1044 Lowry Med. Arts Bldg., St. Paul, Minn.
Wentink, Elaine Anne	U. of Minn., M.B. 1941	Gallinger Hospital, Washington, D. C.
Zagarla, James Francis	U. of Minn., M.B. 1940	Santa Fe Hospital, Topeka, Kansas.

BY RECIPROCITY

Berg, Walter Richard	Marquette U., M.D. 1926	Gillett, Wis.
Lookanoff, Victor Alexander	Rush Med. College, M.D. 1934	Middle River San., Hawthorne, Wis.
Spencer, Philip Lawrence	U. of Iowa, M.D. 1939	Mounds Park Hospital, St. Paul, Minn.

NATIONAL BOARD CREDENTIALS

Brooks, Samuel McLeod	Harvard U., M.D. 1936	Mayo Clinic, Rochester, Minn.
Fawcett, Robert Magwood	U. of Pa., M.D. 1940	Starkweather, N. D.
Gullingsrud, Miles Joseph Orlando	Harvard U., M.D. 1939	Thief River Falls, Minn.
Ould, Carlton Lee	Duke U., M.D. 1937	Duke Hospital, Durham, N. Car.

PROGRAM

International Medical Assembly

Inter-State Postgraduate Medical Association of North America
October 13-14-15-16-17, 1941

Pre-assembly Clinics, Saturday, October 11. Post-assembly Clinics, Saturday, October 18
Minneapolis Hospitals
MINNEAPOLIS, MINNESOTA

Monday, October 13
8:00 A. M.

Diagnostic Clinic: "Modern Treatment of Syphilis"—DR. PAUL A. O'LEARY, Professor of Dermatology and Syphilology, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Diagnostic Clinic: "The Management of Intra-thoracic Tumors"—DR. JOHN ALEXANDER, Professor of Surgery, University of Michigan School of Medicine, Ann Arbor, Michigan.

Diagnostic Clinic: "Pancreatic Hepatic Syndrome"—DR. WARREN H. COLE, Professor of Surgery, University of Illinois School of Medicine, Chicago, Illinois.

Intermission for Review of Exhibits

Diagnostic Clinic: "Goitre"—DR. ROBERT S. DINS-MORE, Cleveland Clinic, Cleveland, Ohio.

Diagnostic Clinic: "Undulant Fever"—DR. CHESTER S. KEEFER, Wade Professor of Medicine, Boston University School of Medicine, Boston, Massachusetts.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Maintenance of Nutrition in Surgical Patients"—DR. ISIDOR S. RAVDIN, George Leib Harrison Professor of Surgery, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Medical Treatment of Gallstones and Cholecystitis"—DR. JOHN H. MUSSER, Professor of Medicine, Tulane University School of Medicine, New Orleans, Louisiana.

Address: "Coronary Artery Disease"—DR. A. CARLTON ERNSTENE, Head of the Cardiorespiratory Department, Cleveland Clinic, Cleveland, Ohio.

Address: "Cruciate Ligaments of the Knee Joint; Etiology, Pathology, Symptoms, Repair"—DR. WILLIAM R. CUBBINS, Clinical Professor of Bone and Joint Surgery, Loyola University School of Medicine, Chicago, Illinois.

Intermission for Review of Exhibits

Address: "Migraine"—DR. CARL D. CAMP, Professor of Neurology and Chairman of the Department, University of Michigan School of Medicine, Ann Arbor, Michigan.

Address: "Uterine Bleeding"—DR. EMIL NOVAK, Associate Professor of Obstetrics, University of Maryland School of Medicine, Baltimore, Maryland.

Address: "Recent Advances in Our Knowledge of Tetanus"—DR. WARFIELD M. FIROR, Associate Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Address: "Pitfalls in X-ray Diagnosis"—DR. HAROLD D. KERR, Professor of Radiology, State University of Iowa School of Medicine, Iowa City, Iowa.

Dinner Intermission

7:00 P. M.

Address: "High Concentrations of Oxygen in Surgery"—DR. CHARLES W. MAYO, Assistant Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Address: "Possibilities of Attainment in the Conservation of Hearing"—DR. HORACE NEWHART, Professor of Otolaryngology, Rhinology and Laryngology, University of Minnesota School of Medicine, Minneapolis, Minnesota.

Address: "Anesthesia and Surgery"—DR. ERWIN R. SCHMIDT, Professor of Surgery, University of Wisconsin School of Medicine, Madison, Wisconsin.

Address: "Psychoses of Different Age Levels"—DR. LOUIS J. KARNOSH, Associate Clinical Professor of Nervous Diseases, Western Reserve University School of Medicine, Cleveland, Ohio.

Address: "Virus Diseases"—DR. ROBERT G. GREEN, Professor of Bacteriology, University of Minnesota Medical School, Minneapolis, Minnesota.

Address: "Hypertension and the Surgical Kidney"—DR. WILLIAM F. BRAASCH, Professor of Urology, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Tuesday, October 14
8:00 A. M.

Diagnostic Clinic: "Stones in the Upper Urinary Tract"—DR. C. DONALD CREEVY, Assistant Dean and Associate Professor of Surgery and Urology, University of Minnesota School of Medicine, Minneapolis, Minnesota.

Diagnostic Clinic: "Diseases of the Lungs in the Aged"—DR. JAMES G. CARR, Professor of Medicine, Northwestern University School of Medicine, Chicago, Illinois.

Diagnostic Clinic: "Carcinoma of the Stomach"—DR. GEORGE P. MULLER, Professor of Surgery, Jefferson Medical College, Philadelphia, Pennsylvania.

Intermission for Review of Exhibits

Diagnostic Clinic: "Neuritides"—DR. JOHN C. MCKINLEY, Professor of Medicine and Nervous and Mental Diseases, University of Minnesota Medical School, Minneapolis, Minnesota.

Diagnostic Clinic: "Endocrine Problems in the Male"—DR. WILLARD O. THOMPSON, Clinical Professor of Medicine, Rush Medical College of the University of Chicago, Chicago, Illinois.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Management of Cardiac Patients Who Require Surgery"—DR. HERRMAN L. BLUMGART, Associate Professor of Medicine, Harvard Medical School, Boston, Massachusetts.

Diagnostic Clinic: "Management of Complicated Fractures of the Extremities"—DR. CLAY RAY MURRAY, Associate Professor of Surgery, Columbia University College of Physicians and Surgeons, New York, New York.

Address: "The Prevention and Medical Treatment of Pre-eclamptic and Eclamptic Toxemia of Pregnancy"—DR. SOMA WEISS, Hersey Professor of the Theory and Practice of Physic, Harvard Medical School, Boston, Massachusetts.

Address: "The Role of the General Practitioner in the Prevention of Blindness"—(The Schneider Foundation Eye Presentation)—DR. HARRY S. GRADLE, Professor of Ophthalmology (Extra Mural), Northwestern University School of Medicine, Chicago, Illinois.

Intermission for Review of Exhibits

Address: "Purpura"—DR. ERNEST H. FALCONER, Clinical Professor of Medicine, University of California School of Medicine, San Francisco, California.

Address: "Cause and Treatment of Circulatory Failure in Surgery"—DR. DALLAS B. PHEMISTER, Professor of Sur-

gery, University of Chicago, The School of Medicine, Chicago, Illinois.

Address: "The Treatment of Injuries to the Peripheral Arteries with Particular Reference to Arteriovenous Fistula"—DR. EMILE F. HOLMAN, Professor of Surgery, Stanford University School of Medicine, San Francisco, California.

Address: "The Diagnosis and Surgical Management of Brain Tumors"—DR. ALFRED W. ADSON, Professor of Neurosurgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Dinner Intermission

7:00 P. M.

Address: "Diagnosis and Treatment of Wounds of the Heart"—DR. DANIEL C. ELKIN, Joseph B. Whitehead Professor of Surgery, Emory University School of Medicine, Atlanta, Georgia.

Address: "The Parathyroids and Diseases of the Bones"—DR. THOMAS P. SPRUNT, Professor of Clinical Medicine, University of Maryland School of Medicine; Visiting Physician, Johns Hopkins Hospital, Baltimore, Maryland.

Address: "Prostatic Obstruction"—DR. WILLIAM E. LOWER, Cleveland Clinic, Cleveland, Ohio.

Address: "Nonoperative Treatment of Acute and Chronic Sinus Disease"—DR. GEORGE E. SHAMBAUGH, JR., Associate Clinical Professor of Laryngology and Otology, Rush Medical College, Chicago, Illinois.

Address: "The Use of Pedicle Muscle Grafts in Obliterating Non-tuberculous Empyema Cavities"—DR. HOWARD K. GRAY, Assistant Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Address: "Disturbances of the Vascular System in Pregnancy"—DR. JOHN L. McKELVEY, Professor of Obstetrics and Gynecology, University of Minnesota School of Medicine, Minneapolis, Minnesota.

Wednesday, October 15

8:00 A. M.

Diagnostic Clinic: "Regional Ileitis"—DR. CLAUDE F. DIXON, Associate Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Diagnostic Clinic: "Types of Clinical Nutritional Deficiency"—DR. VIRGIL P. W. SYDENSTRICKER, Professor of Medicine, University of Georgia School of Medicine, Augusta, Georgia.

Diagnostic Clinic: "Bleeding Peptic Ulcers"—DR. ROSCOE R. GRAHAM, Assistant Professor of Surgery, University of Toronto Faculty of Medicine, Toronto, Canada.

Intermission for Review of Exhibits

Diagnostic Clinic: "The Itching Skin"—DR. OLIVER S. ORMSBY, Clinical Professor of Dermatology, Rush Medical College, Chicago, Illinois.

Diagnostic Clinic: "Surgery of the Biliary Tract"—DR. FRANK H. LAHEY, Lahey Clinic, Boston, Massachusetts.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Differential Diagnosis and Treatment of Anemia"—DR. RUSSELL L. HADEN, Cleveland Clinic, Cleveland, Ohio.

Pathological Clinical Conference. Participants: DR. HENRY M. WINANS, Professor of Medicine, Baylor University College of Medicine, Dallas, Texas. DR. VIRGIL P. W. SYDENSTRICKER, Professor of Medicine, University of Georgia School of Medicine, Augusta, Georgia. DR. E. T. BELL, Professor of Pathology, University of Minnesota Medical School, Minneapolis, Minnesota. DR. OWEN WANGENSTEEN, Professor of Surgery, University of Minnesota School of Medicine, Minneapolis, Minnesota. DR. LEO P. RIGLER, Professor of Radiology, University of Minnesota School of Medicine, Minneapolis, Minnesota.

Address: "Postoperative Pulmonary Complications"—DR. ELLIOTT C. CUTLER, Moseley Professor of Surgery, Harvard Medical School, Boston, Massachusetts.

Address: "Plastic Operations on the Lower Urinary Tract for Congenital Deformities"—DR. HUGH H. YOUNG, Professor of Urology, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Intermission for Review of Exhibits

Address: "Significance of Convulsions"—DR. WALTER E. DANDY, Adjunct Professor of Neurological Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Address: "Treatment of Gonadal Hypofunction in the Female"—DR. ELMER L. SEVRINGHAUS, Professor of Medicine, University of Wisconsin School of Medicine, Madison, Wisconsin.

Address: "Some of the Advantages of Closed Anastomosis in Gastrointestinal Resections"—DR. OWEN H. WANGENSTEEN, Professor of Surgery, University of Minnesota School of Medicine, Minneapolis, Minnesota.

ASSEMBLY DINNER

7:00 P. M.

For members of the profession, their ladies and friends.

Informal.

DR. ROSCOE R. GRAHAM, President of the Inter-State Postgraduate Medical Association of North America—Master of Ceremonies.

Thursday, October 16

8:00 A. M.

Diagnostic Clinic: "Burns and Reconstructive Surgery"—DR. N. LOGAN LEVEN, Assistant Professor of Clinical Surgery, University of Minnesota School of Medicine, St. Paul, Minnesota.

Diagnostic Clinic: "Unexplained Fever"—DR. J. MURRAY KINSMAN, Associate Professor of Medicine, University of Louisville School of Medicine, Louisville, Kentucky.

Diagnostic Clinic: "Diverticulitis"—DR. JOHN F. ERDMANN, Attending Surgeon, New York Postgraduate Medical School, New York, New York.

Intermission for Review of Exhibits

Diagnostic Clinic: "The Etiology and Treatment of Nephrosis in Children"—DR. IRVINE McQUARRIE, Professor of Pediatrics, University of Minnesota School of Medicine, Minneapolis, Minnesota.

Diagnostic Clinic: "Cancer of the Colon"—DR. THOMAS E. JONES, Cleveland Clinic, Cleveland, Ohio.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Clinical Demonstration of Cases Illustrating the Common Types of Arthritis and the Present Status of Therapy"—DR. RALPH PEMBERTON, Professor of Medicine, University of Pennsylvania Postgraduate School of Medicine, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Automobile Injuries"—DR. JOHN J. MOORHEAD, Professor of Clinical Surgery, New York Postgraduate Medical School, New York, New York.

Address: "The Rise and Fall of Focal Infection"—DR. RUSSELL L. CECIL, Professor of Clinical Medicine, Cornell University Medical College, New York, New York.

Address: "Bronchiectasis"—DR. EVARTS A. GRAHAM, Professor of Surgery, Washington University School of Medicine, St. Louis, Missouri.

Intermission for Review of Exhibits

Address: "Pneumonia"—DR. HOBART A. REIMANN, Magee Professor of Practice of Medicine and Clinical Medicine, Jefferson Medical College, Philadelphia, Pennsylvania.

Address: "Osteomyelitis"—DR. FRANK R. OBER, Assistant Dean and John B. and Buckminster Brown Clinical Professor of Orthopedic Surgery, Harvard Medical School, Boston, Massachusetts.

Address: "Caesarean Section"—DR. JOHN R. FRASER, Professor of Obstetrics and Gynecology, McGill University Faculty of Medicine, Montreal, Canada.

Address: "Physiological Studies on the Usefulness of Helium in Respiratory Mixtures"—DR. MAURICE B. VISSCHER, Professor of Physiology, University of Minnesota Medical School, Minneapolis, Minnesota.

Dinner Intermission
7:00 P. M.

Address: "Peritonitis"—DR. FREDERICK A. COLLIER, Professor of Surgery, University of Michigan School of Medicine, Ann Arbor, Michigan.

Address: "Heredity in the Clinic"—DR. LEWELLYS F. BARKER, Professor Emeritus of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Address: "Subcutaneous Injuries of the Abdomen"—DR. FREDERICK CHRISTOPHER, Associate Professor of Surgery, Northwestern University School of Medicine, Evanston, Illinois.

Address: "Renal Tuberculosis"—DR. HERMAN L. KRETSCHMER, Clinical Professor of Surgery (Genito-Urinary), Rush Medical College, Chicago, Illinois.

Address: "Present Status of Surgery of the Heart"—DR. CLAUDE S. BECK, Associate Professor of Surgery, Western Reserve University School of Medicine, Cleveland, Ohio.

Address: "Preoperative Preparation for Gastro-Intestinal Surgery"—DR. VERNE C. HUNT, Clinical Professor of Surgery, University of Southern California School of Medicine, Los Angeles, California.

Address: "Clinical Use of Digitalis"—DR. PETER T. BOHAN, Professor of Medicine, University of Kansas School of Medicine, Kansas City, Missouri.

Friday, October 17
8:00 A. M.

Diagnostic Clinic: "Nervous Exhaustion as a Cause of Gastrointestinal Symptoms"—DR. WALTER C. ALVAREZ, Professor of Medicine, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Diagnostic Clinic: "The Problem of Difficult Hernias"—DR.

W. WAYNE BABCOCK, Professor of Surgery and Clinical Surgery, Temple University School of Medicine, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Differential Diagnosis of Jaundice"—DR. WALLACE M. YATER, Professor of Medicine and Director of the Department, Georgetown University School of Medicine, Washington, D. C.

Intermission for Review of Exhibits

Diagnostic Clinic: "Ulcerative Colitis"—DR. RICHARD B. CATTELL, Lahey Clinic, Boston, Massachusetts.

Diagnostic Clinic: "The Treatment of Diabetes of Long and Short Duration"—DR. ELLIOTT P. JOSLIN, Clinical Professor of Medicine, Harvard Medical School, Boston, Massachusetts.

Noon Intermission
1:00 P. M.

Diagnostic Clinic: "Cancer of the Breast"—DR. FRANK E. ADAIR, Assistant Professor of Clinical Surgery, Cornell University Medical College, New York, New York.

Diagnostic Clinic: "Ascites"—DR. LEROY H. SLOAN, Professor of Medicine, University of Illinois College of Medicine, Chicago, Illinois.

Address: "Adrenal Tumors"—DR. WALTMAN WALTERS, Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Intermission for Review of Exhibits

Address: "Prevention of Rickets with a Small, Single, Parenteral Administration of Vitamin D₃"—DR. HENRY J. GERSTENBERGER, Professor of Pediatrics, Western Reserve University School of Medicine, Cleveland, Ohio.

Address: "Head Injuries"—DR. ERIC OLDBERG, Professor of Neurology and Neurological Surgery, University of Illinois School of Medicine, Chicago, Illinois.

Address: "Acute and Chronic Glomerulonephritis"—DR. E. T. BELL, Professor of Pathology, University of Minnesota Medical School, Minneapolis, Minn.

INTERNATIONAL MEDICAL ASSEMBLY

INTER-STATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

Municipal Auditorium, Minneapolis, Minnesota

October 13, 14, 15, 16, 17, 1941

Pre-Assembly Clinics, October 11; Post-Assembly Clinics, October 18, Minneapolis Hospitals

President, Dr. Roscoe R. Graham
President-Elect, Dr. George R. Minot
Managing Director, Dr. William B. Peck
Secretary, Dr. Tom B. Throckmorton

Director of Exhibits, Dr. Arthur G. Sullivan
Treasurer and Director of Foundation Fund, Dr. Henry G. Langworthy

Chairman Program Committee, Dr. George W. Crile
General Chairman Minneapolis Committees, Dr. Charles E. Proshok

ALL MEDICAL MEN AND WOMEN IN GOOD STANDING CORDIALLY INVITED

Intensive Clinical and Didactic Program by World Authorities

The following is the list of members of the profession who will take part on the program:

Frank E. Adair, New York, N. Y.
Alfred W. Adson, Rochester, Minn.
John Alexander, Ann Arbor, Mich.
Walter C. Alvarez, Rochester, Minn.
W. Wayne Babcock, Philadelphia, Pa.
Lewellys F. Barker, Baltimore, Md.
Claude S. Beck, Cleveland, Ohio.
E. T. Bell, Minneapolis, Minn.
Herman L. Blumgart, Boston, Mass.
Peter T. Bohan, Kansas City, Mo.
William F. Braasch, Rochester, Minn.
Carl D. Camp, Ann Arbor, Mich.
James G. Carr, Chicago, Ill.
Richard B. Cattell, Boston, Mass.
Russell L. Cecil, New York, N. Y.
Frederick Christopher, Evanston, Ill.
Warren H. Cole, Chicago, Ill.
Frederick A. Coller, Ann Arbor, Mich.
C. Donald Crevey, Minneapolis, Minn.
William R. Cubbins, Chicago, Ill.
Elliott C. Cutler, Boston, Mass.
Walter E. Dandy, Baltimore, Md.
Robert S. Dinsmore, Cleveland, Ohio.
Claude F. Dixon, Rochester, Minn.
Daniel C. Elkin, Atlanta, Ga.
John F. Erdmann, New York, N. Y.
A. Carlton Ernstone, Cleveland, Ohio

Ernest H. Falconer, San Francisco, Calif.
Warfield M. Firor, Baltimore, Md.
John R. Fraser, Montreal, Canada
Henry J. Gerstenberger, Cleveland, Ohio
Harry S. Gradle, Chicago, Ill.
Everts A. Graham, St. Louis, Mo.
Roscoe R. Graham, Toronto, Canada
Howard K. Gray, Rochester, Minn.
Robert G. Green, Minneapolis, Minn.
Russell L. Haden, Cleveland, Ohio
Emile F. Holman, San Francisco, Calif.
Verne C. Hunt, Los Angeles, Calif.
Thomas E. Jones, Cleveland, Ohio
Elliott P. Joslin, Boston, Mass.
Louis J. Karnosh, Cleveland, Ohio
Chester S. Keefer, Boston, Mass.
H. Dabney Kerr, Iowa City, Iowa
J. Murray Kinsman, Louisville, Ky.
Herman L. Kretschmer, Chicago, Ill.
Frank H. Lahey, Boston, Mass.
N. Logan Leven, St. Paul, Minn.
William E. Lower, Cleveland, Ohio
Charles W. Mayo, Rochester, Minn.
John L. McKelvey, Minneapolis, Minn.
John C. McKinley, Minneapolis, Minn.
Irvine McQuarrie, Minneapolis, Minn.
John J. Moorhead, New York, N. Y.

George P. Muller, Philadelphia, Pa.
Clay Ray Murray, New York, N. Y.
John H. Musser, New Orleans, La.
Horace Newhart, Minneapolis, Minn.
Emil Novak, Baltimore, Md.
Frank R. Ober, Boston, Mass.
Paul A. O'Leary, Rochester, Minn.
Eric Oldberg, Chicago, Ill.
Oliver S. Ormsby, Chicago, Ill.
Ralph Pemberton, Philadelphia, Pa.
Dallas B. Pheister, Chicago, Ill.
Isidor S. Ravdin, Philadelphia, Pa.
Hobart A. Reimann, Philadelphia, Pa.
Erwin R. Schmidt, Madison, Wis.
Elmer L. Sevringhaus, Madison, Wis.
George E. Shambaugh, Chicago, Ill.
Leroy H. Sloan, Chicago, Ill.
Thomas P. Sprunt, Baltimore, Md.
Virgil P. W. Sydenstricker, Augusta, Ga.
Willard O. Thompson, Chicago, Ill.
Maurice B. Visscher, Minneapolis, Minn.
Waltman Walters, Rochester, Minn.
O. H. Wangenstein, Minneapolis, Minn.
Soma Weiss, Boston, Mass.
Henry M. Winans, Dallas, Texas
Wallace M. Yater, Washington, D. C.
Hugh H. Young, Baltimore, Md.

Hotel Headquarters
Hotel Nicolle - Hotel Radisson

HOTEL
RESERVATIONS

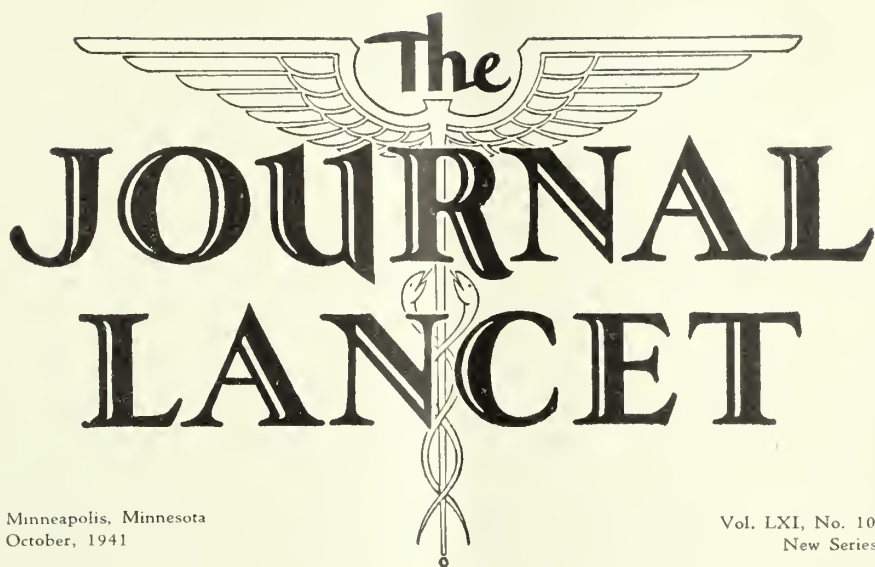
Hotel Committee: Dr. A. N. Bessen Jr., Chairman
829 Medical Arts Bldg., Minneapolis, Minnesota

A program will be mailed to every member of the medical profession in good standing in the United States and Canada on or about September first.

Any member of the profession in good standing who does not receive a program, please write the Managing-Director and one will be mailed.

COMPREHENSIVE SCIENTIFIC AND TECHNICAL EXHIBIT

SPECIAL ENTERTAINMENT FOR THE LADIES



The
JOURNAL
LANCET

Minneapolis, Minnesota
October, 1941

Vol. LXI, No. 10
New Series

The Sex Steroid Family*

E. C. Hamblen, M.D.†

Durham, North Carolina

HORMONES, too often, are regarded as rather vague, ephemeral members of the therapeutic armamentarium. Their humoral ancestry is responsible, perhaps in part, for this concept. Certainly the uncritical dogmata of the older descriptive endocrinologists have done little to divest these pharmacologic agents of their metaphysical and legerdemainian cauls.

In casting about for a subject broad enough in its aspects to hold some interest for a group of physicians representative of the many special branches of medicine, such as comprises your membership,—and, yet at the same time, a subject sufficiently far removed from the every day problems of my practice to protect you against being bored with the shop talk of an endocrine gynecologist,—I chose the subject of "The Sex Steroid Family." It is hoped that a review of some of the characteristics of members of this family may prove not only instructive but also result in the endowment of hormones in general with a more corporeal soma.

The sex steroid family is an important constituent of the larger "cholane clan," which comprises all the individuals with a common phenanthrene-cyclopentane or cholane nucleus. Counted among the families of this clan, in addition to the sex steroids, are cholesterol and stigmasterol, certain digitalis glucosides, the bile acids, various of the opium alkaloids and some of the bufotoxins. Cholesterol often is regarded as the matriarch

of the sex steroids. The determination of its exact chemical nature was the key which revealed the genealogy of the entire cholane clan.

With an immediate reassuring preface that I have no intention of dealing in detail with the complicated chemistry of these sex steroids, a few general orientational statements will be made regarding their chemical properties. As the name steroid indicates these substances are higher alcohols. Their chemical characteristics have been well delineated: structural formulas have been assigned them; reactive groups have been identified; syntheses of various ones have been performed; and various intermediate products of their anabolism and catabolism have been studied. In common with the higher alcohols, these steroids are stable, require no refrigeration (as many biologicals do) and do not deteriorate with age. They form esters with various acids. In general, conjugation or esterification decreases their activity, often by prolonging it. These steroids are excreted by the kidneys in conjugated form, as glucuronic acid esters. Many of these steroids, particularly those known as 17-ketosteroids, give characteristic color reactions with certain reagents, as a result of which colorimetric quantitation of them is possible in addition to the more commonly employed titrational methods based upon bioassay. Since these compounds contain no protein or protein-like radicals, allergic phenomena do not follow their employment; since they are dispensed frequently in solution in diverse vegetable oils, sensitivity to these oils may produce, however, untoward

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†From the endocrine division of the department of obstetrics and gynecology, Duke University School of Medicine and Duke University.

reactions. When used therapeutically the sex steroids have been found active by the following routes of administration: per os, by subcutaneous or intramuscular injection, by direct absorption through mucous membrane (vagina, nose), by inunction into the unbroken skin and by implantation of sterile pellets of the crystalline substance. The chemical purity of these steroids permits dosages to be given in terms of milligrams or fractions of milligrams, if there is desire to avoid the use of various "units" which have often proven confusing. Both free steroid and its esters are usually available for therapy.

The first of the sex steroids to be prepared in crystalline form and to be identified chemically was *estrone*. This major milestone in modern endocrinology was reached in 1929. In 1930, the second sex steroid was isolated; it is known as *estriol*. Both of these were recovered from pregnancy urine and were regarded as the true female sex hormone, whose specific estrual properties had been established by biological methods in 1923. In 1935, however, another estrogenic steroid was isolated—*estradiol*; this time its source was the ovary itself. Subsequently, small amounts of estradiol have been found also in the urine of pregnancy. At present the consensus is that *estradiol* is the mother estrogen as elaborated by the ovary and that *estrone* and *estriol* constitute degraded and excretory forms of *estradiol*. It is assumed that *estrone* and *estriol* likewise composed the bulk of the urinary estrogens of non-pregnant women.

The other steroid which is important in gynecic physiology is the one associated with corpus luteum activity. Its biologic test was perfected in 1929, but it was not until 1934 that *progesterone* was isolated from corpora lutea. *Progesterone* differs chemically in an important respect from the estrogenic steroids; it is not excreted as such in the urine. This is due apparently to the fact that it does not form esters without undergoing significant alterations itself. *Pregnanediol glucuronide*, a biologically inactive steroid, has been identified as one of the excretory products of *progesterone*. At least four other steroids of no other clinical significance at present likewise have been related to the catabolism of *progesterone*.

Both the estrogenic and corpus luteum steroids have been synthesized. Most of the commercial preparations of these are prepared by synthesis from some of the more common steroids such as cholesterol, stigmaterol and pregnandioli. Some new sex steroids have been formed by chemical manipulation of the naturally occurring hormones: i. e., *ethinyl estradiol* and *pregneninonol* from *estradiol*. *Pregneninonol*, which has progesterone-like properties, will be discussed later. An interesting side light on *estradiol* is that it was synthesized from *estrone* before it was proven to be a naturally occurring steroid.

In the past several years much interest has been aroused by the proof that relatively simple chemical substances prepared by methods of synthesis have estrogenic properties. The most exhaustively studied of these

chemicals is a group of compounds derived from *stilbene*, in particular *diethylstilbestrol* and its esters. This chemical and others of the same class are not hormones but pharmacologic active drugs. They bear no chemical kinship to the members of the sex steroid family or the cholane clan, since they do not contain the characteristic phenanthrene-cyclopentane nucleus. There is no proof nor any reasonable likelihood that these chemical substances are altered by biologic contact into true steroid hormones. The more scientific attitude, doubtlessly, is to regard these compounds as being non-hormonal estrogens, which are incapable of entering into the close reciprocities and functional mutations which will be shown to characterize the members of the sex steroid family. The adoption of these non-hormonal substances should not be forced upon the sex steroid family because of their sterling pharmacologic properties or because of their humble costs: the result might be irreparable damage to the harmonies and efficient economy of this family. The Food and Drug Administration has done wisely in refusing, as yet, the admission of these drugs to commerce: they may prove to be fifth columnists which may destroy the integrity of a worthy, respectable and valuable endocrine family.

While extracts of testes were shown as early as 1927 to possess androgenic properties (ability to stimulate the growth of the male accessory sexual organs), the androgenic steroids were not identified chemically until 1934. *Androsterone* was recovered from the urine of males. *Testosterone* was extracted from bull testes. Subsequently, two other steroids were isolated from male urine: *dehydroisoandrosterone* and *etiocholanol-3(α)-17-one*, the former of which has relatively little and the latter no biological activity. The consensus in regard to the relationship of these steroids to each other is similar to that of the estrogens: *testosterone* is regarded as the father steroid elaborated by the testes while *androsterone* and *dehydroisoandrosterone* are considered to be degraded and urinary excretory products of *testosterone* metabolism. *Etiocholanol-3(α)-17-one* is probably of direct adrenal origin.

The adrenal cortex must be regarded to be a busy chemical laboratory indeed if one considers that all the various steroids reported to have been extracted from that gland actually were formed there. The only one of these steroids which will concern us in this discussion is *desoxycorticosterone*. An acetate of this steroid was prepared in 1937 from stigmaterol. It was recovered the following year from extracts of beef adrenals. *Desoxycorticosterone*, being *21 oxyprogesterone*, was thought at first to give promise of being a steroid with possibly important progesterone-like properties. Subsequently, however, in 1939 its striking effects on water and electrolyte metabolism becoming recognized, it was considered to be possibly the long searched for "life-preserving principle" of the adrenal cortex. While not discounting the pharmacologic importance of this steroid, the present consensus is that it does not constitute a complete adrenocortical hormone since it lacks the carbohydrate

factor possessed by some of the other fractions derived from adrenal extracts.

The question constantly comes up as to the nature of the common precursor or ancestor of these steroids and its place of abode. It has been assumed commonly that cholesterol or some of its close kin probably stands in close relationship to the sex steroid family. More and more evidence is accumulating that the adrenal cortex is probably the birthplace of all these steroids. Some of this evidence may be cited briefly at this time while other suggestive data will unfold later in this discussion. Gonadectomized males continue to excrete *androsterone*, *dehydroisoandrosterone* and *etiocholanol-3(α)-17-one* in their urines, thus indicating that the testes are not the only source of the precursors of the steroids. Gonadectomized females may excrete small but assuredly definite amounts of estrogenic steroids and *pregnandiol* in their urines, which fact indicates an extra-ovarian source of these. It has been suggested, however, in opposition to the adrenal homestead theory that, perhaps, all sex steroids may originate from a common ancestor in the pituitary, believed to be *pregnandiene Δ 4.8 diol 17.21 trione 3.11.20*.

Already in this discussion, we have called attention to the harmoniously coöperative activities of this steroid family which lead to "give and take" qualitative mutations and quantitative fluctuations in function dependent upon the existing contingencies and demands made upon various members of this group. In a highly specialized and organized socialistic community, women may take over the work of men and vice versa. Similarly, the sex steroids may ignore the commonly accepted confines of sexual segregation. At first the disregard of these steroids for what had been considered from *a priori* rationalizations to be sexual conventions precipitated a delicate dilemma in the ranks of the students of sex biology. Now, however, biologists have learned to accept the members of the sex steroid family as bisexual or asexual individuals. Some of these sexual peculiarities will be reviewed.

The advent of powerful "male" and "female" sex hormones led to a simon-pure concept of the endocrinology of sex which fostered the belief in a qualitative and quantitative concept of its expression. It was believed that the "female" hormone was the endocrine endowment of woman while the "male" hormone was the undisputed heritage of the male. It was suggested that those individuals who live in a limbo of sexual indefiniteness, those pseudohermaphrodites, hermaphrodites and homosexuals, probably by some peculiar quirk of nature had received a male's and a female's moiety of sex hormones. In fact, it was hoped that it would be possible to grade the severity of some of these sexual inversions by quantifying the levels of "male" and "female" hormones in the body fluids of these patients. Therefore, it was not without some embarrassment and even some subsequent acrimonious rebuttals, that the discovery was announced of the upsetting fact that normal women concerning whose femininity there was no doubt excreted "male" hormones in their urines and that

males whose virility could not be disputed excreted "female" hormones in their urines. Further studies demonstrated the fact that normal women not only excreted the same four androgenic steroids as normal males but also in essentially the same quantities. Thus the older concept that *propter ovarium solum, mulier est quod est* had to be altered to *propter secretiones internas totas, mulier est quod est*.

Since these first disconcerting bits of evidence of the non-specific and universal hormonology of sex, there has been an expansion of the concepts of the role of the various steroids in sex endocrinology. Instead of regarding the heterogenous steroids to be chance contaminants of humoral pattern of a normal male or female, there has developed evidence that the supposed contra-sexual steroids act as "synergists" or "pace-makers" for the iso-sexual ones. Some biologists regard androgens as being the primary sex steroids of both sexes. In the male, estrogens are regarded as secondary degredational products of testosterone, while in the female, the necessity for the transformation of testosterone into estrogens is envisioned. Present opinion generally accepts the purposefulness of this bisexual hormonology from the point of view of its qualitative nature but inclines to believe that characteristic quantitative differences occur in the androgenic/estrogenic ratios of normal males, normal females and those individuals with confused sexualities. The order of the differences in this ratio is toward higher estrogenic levels in the female and lower estrogenic levels in the male, in general the androgenic values remaining the same. A further expression of the qualitative sameness of sex hormonology is afforded by the proof that normal males excrete small but definite quantities of *pregnandiol* (a metabolic product of progesterone) in their urines.

To illustrate still further the overlapping of sexual as well as other pharmacologic functions of these sex steroids, some idiosyncrasies of different individuals of this family will be cited. Despite the fact that *estradiol* and *estrone* have been regarded as being the most important "female sex hormone," studies upon certain experimental animals have necessitated the adoption of the fact that other members of the sex steroid family likewise possess the ability of stimulating the female genital system, i. e., are gynecogenic steroids. In fact, various members of the sex steroid family may be graded as regards their gynecogenicity and have been assigned this order of activity: *estradiol, estrone, testosterone, androsterone* and *progesterone*. Similarly *testosterone* and *androsterone*, despite their birthrights as "male sex hormones" are not the only steroids which are capable of stimulating the accessory sexual organs of the male: various of the estrogens and even *progesterone* possess some androgenic properties.

The synthetic steroid, *pregneninonol*, illustrates by its chemistry and by its properties this sexual non-specificity. *Pregneninonol* is prepared from *estradiol*. Its chemical formula gives it the privilege of having two names: *ethinyl testosterone* or *anhydro-hydroxyprogesterone*. Living up to its Dr. Jekyll and Mr. Hyde

names it has both androgenic and progestational properties. This admixture of "male" function with the most feminine of "female" functions, i. e., that of controlling impregnation and gestation, is not an idiosyncrasy of pregneninolone alone. *Testosterone*, itself, has been shown in the case of certain experimental animals to possess progestational properties and has been accredited with the ability to act as a synergist in the metabolism and utilization of progesterone. Another paradox of endocrine sex biology has been observed in the case of the stallion, whose urine is one of the richest sources of estrogens and whose testes contain far more estrogens per gram of weight than any organ of non-pregnant or pregnant woman.

Similar non-specificities of function exist between some of the gonadal steroids and the adrenal steroids. One of the active principles of the adrenal cortex has been accorded an important "life preserving function." In recent years this function has been defined as being in part concerned with vital roles in the metabolism of water, sodium and various electrolytes. *Desoxycorticosterone* possesses these properties and has been proven capable of maintaining life rather indefinitely in adrenalectomized animals. It is not the only steroid, however, which may do this. Injections of progesterone or the progestin excreted by functional corpora lutea of pregnancy may prolong the life of certain experimental animals. All the various sex steroids possess to some degree the ability of producing positive balances of water, sodium and electrolytes. They may be graded in this regard in the following order of activity: *desoxycorticosterone*, *testosterone*, *progesterone* and *estradiol*. The turgescence of the sexual skin of the monkey, menstrual edema of woman and the plethoric states of normal and eclamptogenic toxemic pregnancy are all expressions of this basic function. The discussion so far should not lead to the belief that these idiosyncrasies can be demonstrated only in the experimental laboratory: clinical experimentation and therapy are replete with many such examples. A few of these will be cited.

Estrogens have been reported capable of curbing the excessive statural growth of hypogonadal and hyperpituitary males by closing their open epiphyses, whereas, on the other hand, testosterone has been found to be without value under these circumstances. Some workers have related prostatic hypertrophy to the action of "unbalanced" estrogens due to the diminishing levels of androgens in the aging male.

Recently testosterone has enjoyed wide and more or less uncritical employment in gynecic therapy, often being used indifferently for estrogens in instances of hypoövarianism. Some workers have reported good subjective responses from androgenic therapy in the female, but, too frequently, the patient has experienced disfiguring and grave andromimetic or virilizing sequelae. One of these has been the appearance of a masculine facial hirsuties. A strange and incongruous experience of a different sort has characterized the androgenic therapy of hypogonadal males. Despite the striking sexual maturation which follows this type of therapy, none of

the eunuchs or hypogonadal males treated with androgens has grown any man-like beards. Another sexual peculiarity of androgenic action has been encountered: Not infrequently therapy of hypogonadal males with testosterone has to be discontinued because of the development of gynecomastia, while on the other hand, androgenic steroids have been described as being of value in the treatment of hypermastia and undesired lactation in the female. Estrogenic or androgenic steroids regardless of the sex of the patient have been described as being of therapeutic value when applied intranasally in the condition known as ozena or atrophic rhinitis.

It has been suggested that these idiosyncrasies of response of the two sexes to estrogens and androgens may be due to an ability of body metabolism to convert these steroids one to the other. There is some clinical evidence to this effect. It has been shown that in males the injection of *testosterone* is followed not only by an increased excretion of androgens in the urine, but also of estrogens. This increase in estrogens has been found to be roughly equivalent to that which might be derived from the conversion of 10 to 20 per cent of the testosterone injected. Similar findings have been encountered in the female. Disorders of such steroid metabolism may aggravate these contrasexual conversions and may constitute, indeed, an important etiologic factor in endocrine disease. Sexual aging in woman is characterized hormonologically by decreases in urinary estrogens and absolute increases in urinary androgens, while senescence of the male is associated with a hormonology of reversed order, by decreases in urinary androgens and apparent increases in urinary estrogens: thus, there is a levelling off of sexuality in geriatrics, which may be regarded from an endocrine standpoint as being characterized by a defeminization of the female and a demasculinization of the male.

Studies of the metabolism of progesterone upon the basis of pregnandiol excretion have indicated striking sexual differences. Injections of *progesterone* in the female result in no striking augmentation of pregnandiol titers and may even produce decreases in these. On the other hand, relatively large amounts of pregnandiol have been recovered from the urines of males treated with *progesterone*. Somewhat similar observations have been made regarding the metabolism of *desoxycorticosterone*. When injections of *desoxycorticosterone acetate* are given women no significant increases occur in pregnandiol titers nor does the steroid exert any progestational effects on the endometrium. When *desoxycorticosterone acetate*, however, is given to males, there is a definite excretion of pregnandiol in their urines.

While the more spectacular traits of this sex steroid family have been discussed already, complete familiarity with this family requires a mention of some of their characteristics other than those related strictly to sexual biology.

The epithelial effects of the sex steroids are not confined solely to the elements of the genital tract. A direct effect of these on nasal mucosa has been described. The direct effect of these on buccal and gingival mucosae has

been reported. Other extra-genital epithelial properties may exist.

Effects of steroids on the vascular system, as yet, are poorly defined. Their role in the physiology and pathology of uterine bleeding and of gestational implantation doubtlessly is fundamentally a vascular one. Profound changes occur in the spiral arterioles of the endometrium during the menstrual cycle and at the onset of menstrual bleeding. Ample evidence exists that, while the acme of these changes is a local phenomenon, peripheral fluctuations in the vascular tone and integrity occur cyclicly in distant parts of the body. A better knowledge of the sex steroid family and of vascular physiology and pathology may solve many obscure problems of medicine. Animal experimentations, as well as clinical studies, have indicated that certain of the sex steroids possess definitely stimulating effects upon skeletal muscle. This effect, together with a resulting psychic uplift and sense of euphoria, has resulted at times in distressing cardiac experiences. Sudden deaths from cardiac failure have occurred in patients with Addison's disease who were apparently responding well to therapy with *desoxycorticosterone acetate* and in aged men being treated with *testosterone propionate* for presumed male climacteric. At first there was a tendency to blame these steroids with the possession of cardiopathic properties, but present opinion now relates these accidents to an overloading of hearts which are myocardially insufficient.

The dermal effects of steroids have been striking. A photogenic property has been described for testosterone. This is based upon the observation that certain eunuchs, exposed to actinic rays months before without tanning, have been observed to tan in the dead of winter when given *testosterone injections*. It has been observed that frequently acne in girls is made worse by giving estrogens. At times it has been suggested that intensive estrogenic therapy in the female increases her sensitivity to actinic rays. Some workers have suggested that a relationship may exist between the androgenic levels of women and their complexional coloring. Large doses of stilbestrol, and to some extent of estrogenic hormones, also produce striking mobilization of skin pigment. Young girls who have received large doses of stilbestrol in treatment of adolescent hypoövarianism have developed nipples and areolae of an ebony black color. This has occurred even in cases of the fairest blondes.

The reciprocities which characterize the different members of the sex steroid family likewise are reflected in their dealings with the hormones of the other glands of the body. Intimate associations exist between the gonads, adrenals, pituitary and thyroid. Fluctuations in the level of one gland are commonly reflected in those of other glands. Many of the sex steroids exert powerful effects on the functions of the anterior lobe of the pituitary. These, for the most part, have been described as being of a depressing type. It is conceivable that a better knowledge of the sex steroid family and of its glandular interrelationships may permit not only depression of the pituitary but profound therapeutic adjustments in pituitary function and in the function of other

glands as well. It is not beyond the realm of possibility that the sex steroids may prove to be a medium for actually stimulating glands rather than being solely therapeutic agents to be used for replacement in gonadal deficiencies.

In summary, various members of the steroid family have been introduced, their relationships to each other explained, their individual idiosyncrasies pointed out and some of the far-flung and important functions of this endocrine family explained. The complexities of the pharmacologic responses to and the chemical interrelationships and metabolic vagaries of this steroid family warrant, at present, none but cautious, individualized and securely rationalized therapeutic applications.

DISCUSSION

DR. JOHN L. MCKELVEY: I should like to say again that a remarkable person Dr. Hamblen is. As he said, he has given us permission to make use of his services and we have done that to our own satisfaction and to the Queen's taste. He has, I think, had a very healthy effect on the thinking of the gynecological group here even in the two short days which he has spent with us. I presume most of you know that when studies of the hormonal control of female generative tract began most people were very skeptical. Very shortly after that on the basis of experience with rodents everyone became extraordinarily enthusiastic and I think there are certain groups of people who went through medical school at that time who have not continued to keep in touch with recent developments.

The last six or eight years of hormonal work in gynecology have had as their motive the "debunking" of the theories which we believed before and about which we were very enthusiastic. This has been almost carried to such an extreme that one can name on the ends of one's fingers, the fingers of one hand, the circumstances under which therapeutic interference with these hormones is completely justified outside of the experimental studies.

There can be no question as to the future of this sterol family. We are beginning to think, perhaps, that the illegitimate members of the family, as has been true in history, may add a very great deal. I do believe under any circumstances, that the note which has been struck in these two days in the gynecological group has been healthy. At the present time we must slow down our processes of therapy as well as our processes of thinking in this regard. It is a healthy attitude and I think it is something we would like to pass on. The trouble with all of these things is the number of problems which present themselves but from the point of view of those who are young the danger seems to lie in the wonderful suggestions that these present to us. It is of interest in the pregnancy toxemia field particularly that all of these drugs can so disturb the water metabolism that it is possible by over-dosage to make a patient actually edematous. It is possible with other sterols to actually reverse the direction of water flow away from the tissue toward the blood stream.

There was an interesting discussion last night of premenstrual edema. One guest recounted a case in which premenstrual edema sufficient to produce rupture of muscle fascia and tendon sheaths was relieved by progesterone to the point where the patient was comfortable. Another member detailed a history in which the estrogens had shown an exactly similar response under similar conditions.

Our process of thinking in terms of sterol control of water balance and other gross disturbances, where water balance is very important, is certainly not justified as yet from any accurate information available. We are dealing with extraordinarily potent drugs which we do not understand. We are making use of biological testing which in itself is difficult and which has turned out to be extraordinarily variable even when the same tests are used.

Dr. Hamblen has dedicated his life to this family of drugs. I don't believe and don't think Dr. Hamblen would suggest that there is any reason to give up the expenditure of time and effort, sweat and toil and money in attempting to carry further the work but I do think we must deflate our process of thinking for the time being.

I would like to say we owe a very real debt of gratitude to Dr. Hamblen from the point of view of the Department for having given so generously of his time and effort here.

I would like to have him enlarge on his suggestion that he opposes the release of stilbestrol at this time. I ask this because I think we should inform ourselves.

Dr. C. J. EHRENBURG: I had hoped that some questions on the therapeutic use of sterols would come up. Dr. Hamblen is using these preparations therapeutically. I think we are familiar with what he has done in the gynecological field but there must be some side effects he noted which would be interesting to the members in other branches of medicine. If it isn't imposing on him too much I would like to have him say a few words about the therapeutic use of these sterols.

Dr. EDWIN C. HAMBLÉN: In regard to Dr. McKelvey's question as to why some of us are opposing stilbestrol's release into commerce, sometimes I think we may have a very narrow attitude on the subject. Yet, it may not be so narrow after all. The drug has been proved pharmacologically. My chief objection to stilbestrol's release is the fact that there has not been done as yet sufficient objective study in regard to what it does to a patient's own intrinsic hormone metabolism. It is a drug; it won't change over to the phenanthrene-cyclopentane group, which comprises the natural sex steroids. We throw it into a very harmonious family circle which will give and take. We don't know what happens. I would like to have that clarified before I would be willing to subject women to its contraphysiological use just as they are being subjected to the contraphysiological use of natural occurring estrogens. We have been lucky enough to get by with this uncritical therapy pretty well with natural steroids but what will happen

when we bring this individual into the steroid family?

There have been some suggestions that it may not be quite as benign a substance as we might think: there has been some recent unreported work, with which I am familiar, of individuals who were treated with stilbestrol in rather large doses and who continued to put out a 50 per cent increased amount of estrogenic substance three months after stilbestrol had been stopped. This indicates a likely cumulative action which might not be harmless. This work was based on only two patients but more work of this sort should be done.

We fear cancer, too. That is always a critical sort of thing to bring up. Here is, I think, our ideal opportunity of producing cancer, if potent drugs of this type are carcinogenic; it is cheap, it is active by mouth, it can be put in any drug store, a woman may buy it and take as much as she wants for as long as she desires.

The recent studies that have come out on treating menopausal women with this drug, although with moderately small doses, emphasize one thing in particular, that is the fact that rather commonly these women bleed under therapy although they have not menstruated for years. It would seem to me that such stimulation of senile endometria would not be a healthy affair.

Then we have also the question of pigment changes, particularly the work which Davis has reported of extreme pigmentation of breasts under stilbestrol therapy, breasts of which the nipples and areolas look almost ebony black. We are all so anxious for something cheap but we should be cautious because once we let the drug loose we will have a bad time controlling it.

In regard to Dr. Ehrenberg's question, we have noted many side effects of endocrine therapy; there have been so many one would hardly know how to start recounting them. During the last three years I have had a very interesting pastime which may develop into something worthwhile as the years pass. I have been collecting all the untoward responses to all endocrine therapy. We have run across some most interesting ones. Practically anything may happen, apparently, by way of untoward responses. The steroids come in for their share of blame but the protein-containing substances like pituitary extracts, produce most untoward responses. Many of these untoward responses have occurred in menopausal women. I have heard it said that most of us do not use enough therapy in treating menopause. People we see have gotten too much and they continue to get too much. I think our diagnostic methods are poor: we overlook too many things. I believe it is going to become more and more important to find out the psychiatric pattern of these women, investigate them more that way before we jump into estrogenic therapy.

I have had one patient who developed a paroxysmal tachycardia during estrogenic therapy. Pruritus vulvae occurred in another patient receiving intensive estrogenic therapy. We have had some of these climacteric women thrown into depressive states which the Freudians try to explain on the basis of the associated and undesired stimulation of libido in frigid women.

The most striking side effect that we have seen in

menopausal women are the four women who came to us with notes from their metropolitan physicians, written several years before, recommending that they be given so many units of estrogens whenever the patients happened to stop by. For some years each of the four had just stopped anytime they felt like it and got their hypodermics. All four of these patients came in with marked generalized edemas. Upon discontinuation of estrogens they lost ten to fifteen pounds of water. These cases exemplify the marked disturbance in water balance which will occur. It is interesting that all of these women had had their uteri removed. We believe perhaps they were in a poor position to metabolize steroids properly because they had no uteri, since we have found that treating hysterectomized women with estrogens is much more unsatisfactory than treating a woman with uterus intact. We find that these hysterectomized women are best treated with an estrogen by mouth which requires no metabolism, i. e., emmenin.

We have seen patients who received steroid therapy who had rather striking vascular effects from it. Of course, the menopausal patients with mild hypertension will occasionally get some benefit, some depression in blood pressure. Other hemorrhagic effects have occurred; we have had some petechia from therapy. We have had a rather constant experience of increasing acne in young girls getting estrogenic therapy. We have observed an apparent peculiar effect in young girls. Girls getting estrogens apparently become increasingly sensitive to sunburn. Some studies have reported that males receiving testosterone put on a very fine tan and do not blister or burn. We have found, too, that females who were getting male hormone tend to tan rather than to burn. These are just little chance observations, probably not significant but they happen with fair frequency. There are many, many others.

Dr. J. C. LITZENBERG (by invitation): I have had two experiences very recently and I think perhaps Dr. Hamblen's answer may be a warning to us. I went down to a meeting in New York a couple of weeks ago and in three large clinics they advocated rather enthusiastically the implantation of stilbestrol in pellets under the skin, through a skin incision. That rather shocked me. I was shocked because I had a patient with intolerable vulva itching and to whom an internist in New York had given tremendous doses of stilbestrol. She had not menstruated for 17 years. We made a very careful pathological examination because the patient was the mother of a New York doctor, and found that there was no evidence of malignancy. Just before I had gone to New York I had discontinued this stilbestrol because I feared that the bleeding she was having was from the stilbestrol. We were questioning if we should not do a curettage for possible cancer of the uterus. I went down to New York and these three clinics all advocated the implantation of stilbestrol under the skin. I would like to have an answer to that question because it might be a warning to us regarding this implantation method.

Dr. EDWIN C. HAMBLÉN: I see little reason for implanting the stilbestrol under the skin. It is no trouble for a woman to take a pill a day; the drug is highly active orally. If one is trying to circumvent the undesired gastrointestinal effects which are so common with stilbestrol one gets these regardless of how one gives stilbestrol. If it is given hypodermically one gets nausea and vomiting; if it is given by pellet similar gastrointestinal symptoms may follow. This is due to a toxic effect of the material on the gastrointestinal tract that is exhibited regardless of how one gives the drug. I am well aware of the fact that there are some concerns putting out stilbestrol in enteric-coated tablets, hoping to prevent the nausea and vomiting. This does not seem rational in view of the previous statement.

Dr. CHARLES H. MCKENZIE: Of what value is the interpretation of vaginal smears as an index of therapy in the estrogenic treatment of menopausal disorders?

Dr. EDWIN C. HAMBLÉN: Personally, I have had very little experience with the vaginal smear method. It certainly has a wide following in menopausal therapy. It seems to me we do not need it. After all, we are treating symptoms. Estrogens here constitute symptomatic therapy. If a patient feels better we do not care what the vaginal smear shows. The menopausal symptomatology is very varied; many inciting factors may exist, household worry, fear of cancer, fear that their husbands are going to run away with other women, worrying about the children off at college, paying their university bills, various and sundry things. If one can quiet them by reassurance, a little phenobarbital sometimes, why subject them to estrogens and vaginal smears? I have found that a pat on the back, plus reassurance based on a thorough examination and diagnosis, telling the patient that there was no organic disease, plus a little insight into the home life and family worries, can often avoid endocrine therapy for this condition. When we do give estrogenic therapy, we are able in practically all instances to secure good symptomatic responses from small oral doses of estrogens, in the form of emmenin.

Dr. CHARLES H. MCKENZIE: How about the use of stilbestrol to relieve the hot flashes of the menopause, used temporarily only?

Dr. EDWIN C. HAMBLÉN: I do not see why stilbestrol would be any better than the natural estrogens. It would be cheaper, of course. I do believe that flashes, thermic disturbances, have to be present before we predicate the existence of the so-called menopausal syndrome. Some of the psychiatrists have told us that if a woman of menopausal age does not have clear-cut flashes, estrogenic therapy is unwise and may be harmful.

In this regard let me say that I see no justification for using testosterone or its propionate in treating women. There has been a very general excursion in androgenic therapy of women. I have seen no justification for subjecting a woman to the virilizing effects of testosterone in order to get an effect which estrogens would give. Why lay yourself liable to medico-legal procedures on the basis of producing abnormal hair growth or changing the timber of the voice? The only

possible indication for testosterone that I can envision is its use in an ointment in hypermastia. Such an ointment gives predominantly a local effect, say a ratio of 90 per cent local and 10 per cent constitutional effects; the rationale is to produce a regression in the large breasts without causing any constitutional andromimetic responses.

Dr. CHARLES H. MCKENZIE: At the risk of asking too many questions, I have two more questions. What about the use of stilbestrol postpartum to relieve engorgement of breasts? It apparently has no toxic effects, yet it does give relief.

Dr. EDWIN C. HAMBLÉN: Women have gotten along well with the use of ice-bags and the other things to stop breast congestion. I do not see that breast congestion is fundamentally a condition which requires therapy.

Dr. CHARLES H. MCKENZIE: The other question was in connection with the synthetic drugs, pregneninolone or pranone, in place of progesterone. Your reaction to the use of them, for instance, in dysmenorrhea and habitual abortion?

Dr. EDWIN C. HAMBLÉN: I am going to call it anhydro-hydroxyprogesterone. I have not found any clear-cut therapeutic role for it. It does have corpus luteum activity. It is active orally. We tried to set up an oral form of our cyclic steroid therapy using anhydro-hydroxy-progesterone instead of progesterone. We did not get as good results. It has been reported to be of value in dysmenorrhea. I do not believe dysmenorrhea is an endocrine disease. I think that most women with dysmenorrhea have normal corpus luteum function. I see no rationale in giving corpus luteum therapy in dysmenorrhea.

In regard to habitual abortion, it should do about as well as progesterone. We have been using 40 to 60 mgm. per day. That does not save any money. So far we have not had any abortions occurring in patients who had this therapy.

Dr. GEORGE HUDSON (by invitation): I would like to ask Dr. Hamblen what his experience has been with menopausal arthritis.

Dr. EDWIN C. HAMBLÉN: My experience with menopausal arthritis has been very, very limited. I have observed that patients with menopausal myalgia, menopausal acrodynia and with parathesias, get some relief from small doses of estrogens. I have treated but few patients with true arthritis.

Dr. R. T. LAVAKE: The disturbing feature about progesterone administration in threatened abortion or miscarriage, is the possibility of prolonging an abnormal pregnancy. During one year I had three afetal sacs. Had I used progesterone in these cases, I wonder what would have happened. Have you had any experience with this prolongation of abnormal pregnancies?

Dr. EDWIN C. HAMBLÉN: I haven't had but I know some people who have described such an occurrence.

Dr. R. T. LAVAKE: I would not like to have this experience.

Dr. EDWIN C. HAMBLÉN: Some workers feel that it is well to go ahead and let these people have their abortions, the ones that occur from the third or fourth month if thyroid therapy or hygienic measures do not take care of the situation. Most blighted ova are aborted in the early months. They advise concentration on therapy to try to save those who tend to miscarry or have premature labors, i. e., we should probably let nature go ahead and discard and get rid of those blighted ova.

Dr. R. T. LAVAKE: Discussions such as these are very timely because there has been much loose and ill-considered thinking in regard to what the public call "shots". If a woman aborts, everyone gathers around and judges her physician from the standpoint of whether or not he has given the great "shot" treatment. In their ingenuous exuberance, many physicians are giving the public a very distorted idea of the value of "shots". Most intelligent patients know that miscarriages are often due to abnormalities of the fetus. In the consideration of progesterone treatment, I have been asked not to try it if I have the slightest suspicion that the baby is abnormal. It puts one in a very delicate position. The husband at least should know the dilemma, and understand the problem.

Dr. WM. P. SADLER (by invitation): I had the unhappy experience to which you refer, Dr. LaVake. My patient had aborted three times previously. She was seen threatening to abort at 2½ months gestation; whether it was because of or in spite of the treatment followed, protracted bed rest, biweekly progesterone administration, and other measures, she went on to the seventh month at which time acute hydramnion developed, labor started and she delivered an anencephalic monster.

Dr. H. M. N. WYNNE: Do you prescribe estrogenic substances for a patient who has a family history of carcinoma?

Dr. EDWIN C. HAMBLÉN: I do not. I absolutely refuse to.

Dr. H. M. N. WYNNE: Large quantities of estrogenic substances are being prescribed and undoubtedly sometimes before a careful pelvic examination has been made. Such a patient might have an early carcinoma. I wish to ask if you have any knowledge of such cases on record and if so what apparent effect such therapy had on that cancer?

Dr. EDWIN C. HAMBLÉN: I do not know of any instance of it but I think it would enhance the growth of the carcinoma very much.

A Method of Evaluating the Effect of Treatment in Neuro-Muscular Disorders

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THE conflicting reports on the benefits of vitamin E in certain neuro-muscular disorders^{1,2,3} suggest the need of a quantitative method for evaluating the results of such treatment. This would enable different groups of investigators to compare their results with greater ease and accuracy.

We have treated ten cases of progressive muscular dystrophy and five cases of amyotrophic lateral sclerosis with large amounts of concentrated vitamin E over a period of four to six months. The results of this treatment have been quantitated and contrasted with the results in ten cases of myasthenia gravis receiving oral prostigmine.

The merit of our approach to the problem rests, essentially, upon the following three factors:

The first is a numerical scoring system in which various degrees of improvement may be graded. Simple numbers lend themselves to statistical and percentage analysis, are clear to others, and are less likely to be overweighted by enthusiastic impressions of either patient or doctor. During the last six years, Schwab and Viets⁴ developed and utilized such a scoring table in evaluating the symptomatic changes occurring in myasthenia gravis following the administration of prostigmine. The same set of values was applied in this investigation and are shown in table A with estimates of their percentage equivalents.

Such a scoring system is simple enough to fit into any clinical or laboratory evaluation, and has proved useful in a number of previous studies.

The second factor is the construction of a five-point scale revealing separate and distinct phases of improvement. One is the patient's subjective report after he is carefully informed of the meaning of the scoring values 0 — 4. Two is the physician's report of the situation as a whole viewed objectively and again interpreted according to the scale 0 — 4. Three, four and five are

Table A

Score	Decimal Equivalent
0 no improvement	0— 5%
1 slight improvement	5— 20%
2 moderate improvement	20— 40%
3 considerable improvement	40— 70%
4 marked improvement	70—100%

†From the Myasthenia Gravis Clinic, Massachusetts General Hospital, Paper No. 13, and the department of neurology, Harvard Medical School.

††From the division of nervous and mental diseases, the University of Minnesota Medical School. This work was done while the author was holding a George Chase Christian Memorial Scholarship in the department of neurology, Harvard Medical School.

ERGOGRAMS BEFORE AND AFTER VITAMIN E THERAPY

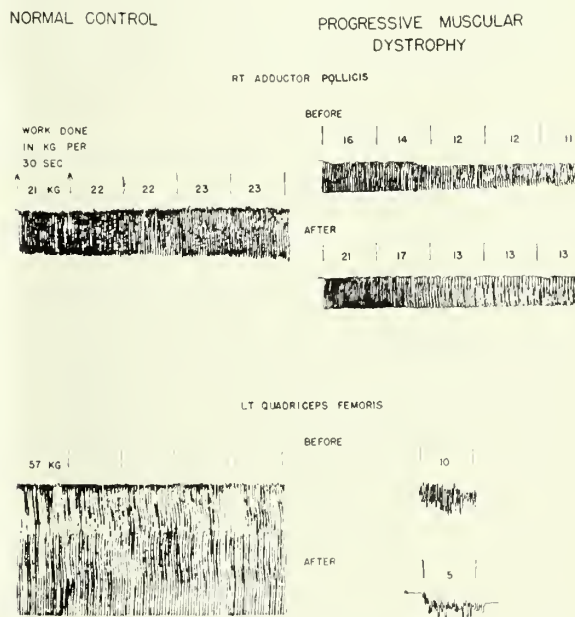


Fig. 1. Ergographic records showing the maximum force exerted by the right adductor pollicis and the left quadriceps femoris muscles of a patient with progressive muscular dystrophy before and after treatment with vitamin E. The amount of work done is computed for each 30 seconds interval. No significant difference in muscle strength is revealed in these tracings obtained four months apart. The records of a normal subject are included for comparison.

more specific tests of a clinical or laboratory nature, the results of which are likewise graded 0 — 4. These tests are more reliable and accurate if they can be done by different investigators, or at least interpreted by two or three people, and mean values agreed to. Thus, if the patient's subjective report and the objective clinical and laboratory scores are all 4, the sum would be 20 (100 per cent result). Discrepancies between subjective and objective values show themselves at once. Poor or negative results stand out clearly in such a chart. Typical examples in a case of myasthenia gravis, a case of progressive muscular dystrophy, and a case of amyotrophic lateral sclerosis are shown in table B.

The third factor relied upon is to use a somewhat similar disease or symptom complex which can be treated successfully by specific means and, with it as a control series, score a reasonable number of such patients in the same manner. Comparing this control group with the

ERGOGRAM STUDIES - CASE NO. 10 Q, 19 YEARS OLD ON VIT E 5 MOS.

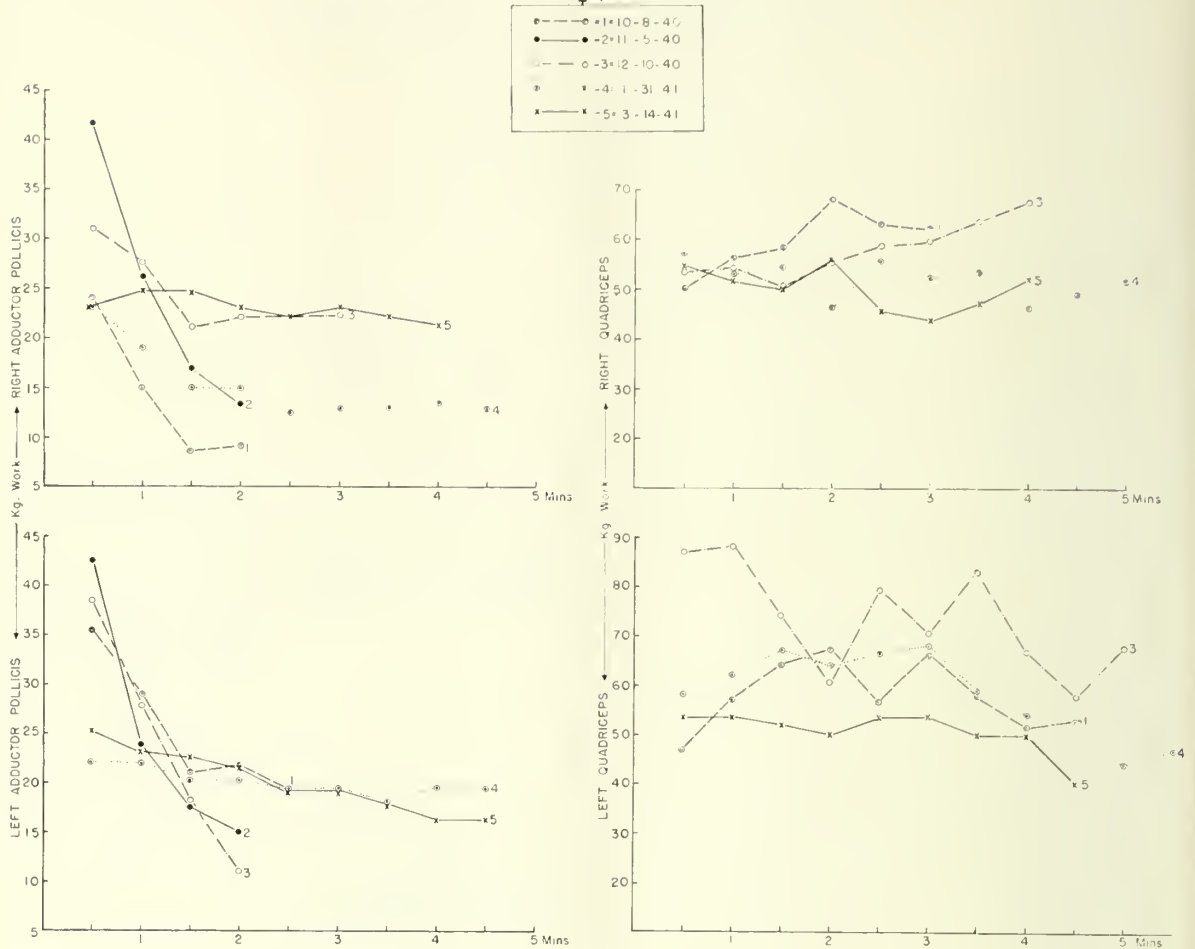


Fig. 2. Chart indicating the method used in plotting the results of a series of ergographic studies on a patient with progressive muscular dystrophy. The dates on which the examinations were made are given in the insert. No importance is attached to differences in the duration of the examination since in each instance the time allowed was arbitrarily set. Although there are some variations in results, these are doubtless due to errors inherent in the technic used; the significant observation is that no consistent trend is evident which would indicate an increase in muscle power after therapy.

Table B

Average Case	Patient's Subjective Report	Physician's Objective Report	Other Specific Objective Tests	Total	Percentage	Type of Result
Myasthenia Gravis	3	3	2 4 3	15	75	Good
Progressive Muscular Dystrophy	1	0	0 0 0	1	5	Poor
Amyotrophic Lateral Sclerosis	1	1	0 0 0	2	10	Poor

first group will give an excellent idea of the relative efficacy of the new treatment.

In this investigation we chose myasthenia gravis for the control group and obtained evaluations on ten consecutive patients being treated with prostigmine orally as they returned to the Myasthenia Gravis Clinic in the Out Patient Department. For Number 3 in the table we chose improvement in the principal presenting complaint (e. g., ptosis); Number 4, fatigue of either adductor pollicis muscle as measured on the ergogram;⁵ and Number 5, changes in the electromyogram obtained

at the same time from that muscle. The results are tabulated in table C.

In the progressive muscular dystrophy group we included ten adult patients, all of whom had been afflicted with the disease for at least several years, and set up the following therapeutic regime:

- A. Each patient had a careful neurological examination by one of us.
- B. Each had a complete muscular examination by an independent orthopedic worker (Dr. Joseph Barr).
- C. Each had an ergographic study (fig. 1) of four

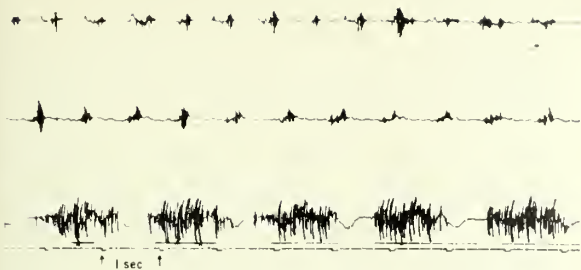


Fig. 3. Three electromyograms showing action potentials produced by maximal voluntary contractions of the left quadriceps femoris muscle. These were recorded from surface electrodes with an ink-writing oscillograph. The uppermost tracing is from a patient with progressive muscular dystrophy before treatment was started, while immediately below is a tracing from the same patient after several months of vitamin E therapy; it is to be noted that the amplitude and grouping of the spikes are practically unchanged. The third tracing is from a normal subject. Calibration and timing are the same for all records.

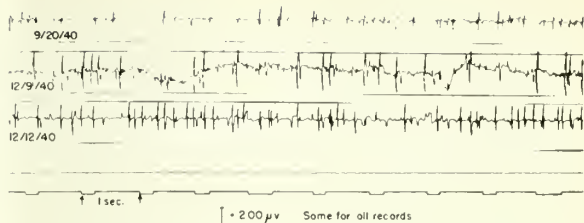


Fig. 4. Electromyograms from muscles at rest. The upper three tracings are from the right deltoid muscle of a patient with amyotrophic lateral sclerosis; all show fibrillations. The first was obtained before treatment was started and the remaining two while he was taking vitamin E. The dates on which the examinations were made are indicated. Fibrillation counts per minute are, respectively, 240, 350, and 390. This patient died one month after the last of these tracings was made. The fourth tracing is from a normal subject; note the complete absence of the irregular discharges seen in fibrillating muscle. Recorded from surface electrodes with an ink-writing oscillograph. Calibration and timing the same for all records.

Table C
Summary Table of the Results of Treatment of 10 Cases of Myasthenia Gravis with Prostigmine

Case Number	Patient's Subjective Report	Physician's Objective Report	Presenting Complaint	Ergogram	Electromyogram	Total	Percentage
20	4	4	3	4	3	18	90
6	3	3	2	4	3	15	75
14	2	2	3	3	2	12	60
50	3	3	4	4	3	17	85
15	2	2	1	2	1	8	40
5	2	3	2	3	3	13	65
49	4	4	4	2	2	16	80
57	3	3	3	4	3	16	80
60	4	4	3	4	3	18	90
62	3.5	3.5	3	3	2	15	75

different muscles — right and left adductor pollicis and right and left quadriceps femoris. The amount of work done by a muscle can be accurately measured from such an ergographic record and the results of a series of examinations may be plotted as shown in fig. 2.

- D. As each ergographic fatigue curve was traced, synchronous electromyograms were obtained from these muscles on a Grass, ink-writing oscillograph (fig. 3).
- E. After these base lines were obtained, the patients were each given 240 mgs. of concentrated, natural vitamin E (Squibb) by mouth daily and were asked to discontinue other medicines which had been previously prescribed. A month or two later, depending upon the availability of the patient, all tests were repeated and the drug then changed to another brand (Winthrop); the same dosage was continued. A third examination was made following another interval of one to two months and then treatment was changed to synthetic vitamin E (Hoffmann-LaRoche), 100 mgs. daily. At the conclusion of this course of treatment a fourth and final examination was made. The total study occupied from four to six months for each patient.

The results were tabulated as evaluated on the basis of the 0—4 scoring system and are presented in table D.

It is apparent that in this group of patients no convincing evidence is produced indicating a favorable response to vitamin E therapy. That is emphasized particularly when these results in progressive muscular dystrophy are contrasted with the favorable results in the myasthenia gravis cases treated with prostigmine.

In the amyotrophic lateral sclerosis group five patients were similarly studied. In this group Number 3 in the table represents the clinical estimation of the changes in the amount of atrophy, Number 4 the observable amount of fibrillation, and Number 5 the average number of fibrillations per minute as revealed by the electromyograph recording from surface electrodes (fig. 4). These patients were treated with synthetic vitamin E (Hoffmann-LaRoche) only for one to four months. The results are shown in table E.

Of these five cases two felt subjectively improved while under treatment, but in only one was there any confirmatory evidence of an objective sort and this change was slight. Our impression from this is that vitamin E is of very little value in the treatment of amyotrophic lateral sclerosis.

Table D
Summary Table of the Results of Treatment of 10 Cases of Progressive Muscular Dystrophy with Vitamin E

Case Number	Patient's Subjective Report	Physician's Objective Report	Ortho. Muscle Exam.	Ergogram	Electro-myogram	Total	Per-centage
1	0	0	0	1	0	1	5
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	1	0	0	0	0	1	5
5	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0
9	0	0	—	0	0	0	0
10	0	0	0	0	1	1	5

Table E
Amyotrophic Lateral Sclerosis

Case Number	Patient's Subjective Report	Physician's Objective Report	Amount Atrophy	Fibrillation Observable	Electro-myogram	Total	Per-centage
1	1	1	0	0	0	2	10
2	0	0	0	0	1	1	5
3*	0	0	0	0	0	0	0
4*	0	0	0	0	0	0	0
5	2	0	0	0	0	2	10

*Cases No. 3 and No. 4 became worse and died.

CONCLUSIONS

1. A method of evaluating treatment in certain neuromuscular disorders is described.
2. Its application in the successful treatment of myasthenia gravis is demonstrated.

3. When used to determine the effect of vitamin E therapy in progressive muscular dystrophy and amyotrophic lateral sclerosis, this method yields results indicating that that treatment is ineffectual.

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Unit Numbers of Cases Listed in Tables
Table C Table D Table E

Case No.	Unit No.	Case No.	Unit No.	Case No.	Unit No.
20	63522	1	46508	1	290144
6	6330	2	191549	2	249423
14	22399	3	91751	3	242214
50	173004	4	93853	4	270257
15	45168	5	137727	5	14510
5	3136	6	6323		
49	199617	7	58234		
57	250378	8	41389		
60	231048	9	272547		
62	232173	10	148511		

Vulnerable Structures of the Bacterial Cell*

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MAN learned to control the activities of microorganisms long before he knew of their existence as independent living agents. In fact, most of the general types of antiseptics known at the present time were employed long before the bacteriological era. Aromatic oils and phenolic compounds, for instance, were extensively used in the art of embalming to prevent changes due to putrefaction; in Persia, an ancient law directed that drinking water was to be kept in bright copper vessels, a measure which undoubtedly served to decrease the spread of intestinal infections; the use of chlorine compounds was advocated by Semmelweis in 1846 to nullify the "cadaveric poisons" on the hands of nurses and physicians.

It must be observed, however, that the common antiseptics such as phenolic derivatives, heavy metals, chlorine compounds, etc., are general protoplasmic poisons which not only inhibit microbial processes but which are also toxic for all types of living cells. The possibility of developing antiseptic agents endowed with selective action and capable, for instance, of attacking certain parasites while respecting the tissues of the host, was only slowly realized. Interestingly enough, Pasteur recorded in his first memoir on lactic acid fermentation that onion juice prevents yeast from fermenting sugar but does not inhibit the lactic ferment. It is very surprising, in view of his training as a chemist and of his great interest in biological specificity, that Pasteur never returned to the problem of selective antiseptics. It was Paul Ehrlich who first clearly formulated a theory of immunity and antiseptics based on considerations of specific structural relations between the cell to be attacked and the antibacterial agent (immune antibody or chemotherapeutic substance). As will be remembered, Paul Ehrlich pictured the cell as possessing a number of chemically reactive groups called "receptors" with which dyes, bactericidal substances, and immune bodies reacted selectively. Characteristic staining reactions, differential susceptibilities to toxic substances, and specific reactions with antibodies could all be explained by postulating the existence of a sufficient number of "receptors" in the bacterial cells. It is this intellectual concept which Paul Ehrlich expressed so vividly in the following statement:

"Antitoxins and antibacterial substances are, so to speak, *charmed bullets* which strike only those objects for whose destruction they have been produced."⁵

Unfortunately, neither Ehrlich nor his immediate followers succeeded in identifying the chemical nature of these receptors; the theory therefore fell into disrepute as an attempt to mask ignorance under a covering of words. During the past two decades, however, immuno-

chemistry has in several cases given reality and chemical definition to the receptors postulated by Ehrlich. It is known, for instance, that the immune sera which are capable of protecting mice against infection with the virulent *Salmonellae* contain antibodies exhibiting a specific affinity for the so-called "O" and "Vi" antigens which have been recognized to be present in these organisms, and which have been obtained in solution in a state of immunological purity.² In the case of hemolytic streptococci (Lancefield Group A) the protective antibodies which result from the immunization of experimental animals with the matt strains of these organisms have been shown to react with a characteristic protein constituent of these bacterial cells.⁹ This protein, the "M" substance, has also been obtained in solution in a purified form. Best understood of course, is the classical example of immunity to pneumococcus infections. In this case the specific antibodies present in the sera of animals immunized with encapsulated pneumococci of the different types afford protection against pneumococcus infections because of their ability to react with the polysaccharides which constitute the bacterial capsules.¹

The antigens which have just been mentioned are not the only ones which can be recognized in the *Salmonellae*, the streptococci or the pneumococci. One can also obtain antibodies directed against other cellular antigenic constituents of the same bacterial species, but most of these antibodies do not protect animals against infection. It has been assumed that to be effective as a protective agent, an antibody must react with a constituent of the bacterial cell which is exposed at or near the cellular surface; on the contrary, cellular components which are situated in the center of the cell cannot be reached by antibodies as long as the cell remains intact, and, consequently, the antibodies which they induce cannot protect against infection.¹²

Immunochemistry has given us, therefore, a better definition of the specific cellular structures—Ehrlich's receptors—which are exposed and vulnerable, and against which are directed the protective immune reactions. Armed with this knowledge, the immunologist has developed immunization procedures which favor the development of the specific antibodies concerned in the protective reactions. Is it not justified to hope that, in the future, new reagents, other than antibodies, can be discovered which will also react with these vulnerable structures of the bacterial cells, and therefore help in combatting infection. Recent observations justify this hope. It has been found, for instance, that certain enzymes can attack the capsular structures of pneumococci and of group C streptococci, and can indeed protect experimental animals against infection with these pathogenic agents.

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As far as is known, the capsular polysaccharides of pneumococci are not decomposed by enzymes of animal or plant origin. Nor are they attacked by common species of microorganisms. It was possible, however, to isolate from soil a sporulating bacillus which hydrolyses the specific polysaccharide of type III pneumococcus. Cultures of this soil bacillus have yielded a soluble enzyme which hydrolyses the capsular polysaccharide and robs it at the same time of its serological activity. The addition of active enzyme to nutrient media does not inhibit the growth or cause the lysis of pneumococci, but pneumococci of type III, cultivated in media containing the enzyme, lose their capsules and fail to agglutinate in specific antiserum of the homologous type. The enzyme is directed against a single specific substance, the capsular polysaccharide, and not against the cell as a whole. Enzymes capable of attacking the capsular polysaccharides of other pneumococcus types have now been obtained from different strains of soil bacteria. Not only are these bacterial polysaccharidases capable of decomposing the capsular substances *in vitro* but they also exhibit the same activity *in vivo*, and in fact protect experimental animals against infection with virulent pneumococci. Let us state again, that the polysaccharidases are neither bacteriolytic nor bactericidal; their protective action lies in their capacity to decompose the protective capsular substances of the pneumococci and thus to render the latter susceptible to phagocytosis.³

It has recently been found that an enzyme present in extract of leeches is capable of hydrolysing the capsular material of group C streptococci. Hirst has been able to show that this enzyme does afford some measure of protection against group C streptococci, although it does not itself kill or lyse the streptococcus cell.⁷

These facts illustrate how a knowledge of the structure of the bacterial cell can guide the search for therapeutic agents other than antibodies. Immunological analysis had revealed that the capsular polysaccharides are among the exposed vulnerable components of certain bacterial species. It is this knowledge which suggested the search for reagents capable of attacking the polysaccharides. The polysaccharidases which have just been mentioned hydrolyse the capsular substances. It is not impossible that other chemical reagents may be found which, by reacting with the polysaccharides or other cellular structures, may interfere with the parasitic career of infectious agents.

We have considered so far cellular structures which were recognized and identified by the methods of immunochemistry. Other methods such as treatment of the cells with specific enzymes, or the controlled use of staining reactions, can also serve to gain an insight into the submicroscopic structure of bacteria. The staining reaction introduced by Gram, for instance, divides the bacterial world into two groups, the Gram positive and the Gram negative. These differ profoundly, not only in their staining reactions, but also with reference to many morphological and physiological characteristics.⁴ It is not possible to discuss here the many views which have been expressed to account for the mechanism of the

Gram stain; in general terms it appears safe to state that the retention of the dye by Gram positive bacteria is conditioned by some peculiar property of the cell wall of these organisms. It was on the assumption that the Gram positive cocci possess a characteristic structure, either of common or of related chemical composition, which determines their Gram reaction, that an effort was made to discover in nature microorganisms capable of attacking this group of cocci. In fact, it has been possible to isolate from soil a sporulating bacillus which produces a soluble principle extremely toxic for all the Gram positive bacteria so far tested. This substance has been called gramicidin on account of its selective bactericidal effect.³

Gramicidin is a crystalline neutral substance soluble in acetone and alcohol and insoluble in water and ether. It is a complex polypeptide containing 2 to 3 tryptophane residues per molecule while a large percentage of the other amino acids appear to be present in the *d* (so-called unnatural) form; gramicidin does not contain either free acid or basic groups.⁸

As stated above, gramicidin inhibits the growth of Gram positive microorganisms *in vitro*; in fact 0.001 mg. of the substance added to 1,000,000,000 pneumococci, streptococci, staphylococci, anthrax bacilli, diphtheria bacilli, etc., may be sufficient to prevent the growth of these organisms on subsequent transfers into common bacteriological media. We have attempted to analyse the mechanism of this remarkable antibacterial action. Surprisingly enough, it appears that gramicidin does not affect most of the metabolic systems of the susceptible bacterial cells; as a matter of fact, the substance not only does not completely destroy bacterial respiration but under certain conditions stimulates oxygen uptake or acid production. It is evident, therefore, that the inhibitory effect on the growth of Gram positive microorganisms is not due to a gross alteration of protoplasm by gramicidin, but more likely to some specific interference with one essential metabolic function. This view is confirmed by the fact that, under certain conditions, the injury caused by gramicidin is reversible and that cells which have lost their ability to grow as a result of gramicidin treatment can again recover their viability when the phospholipid cephalin is added to the culture medium.

We can conclude, therefore, that gramicidin does not belong to the class of general protoplasmic poisons, but rather to that of selective inhibitors. It is probably by reason of its selective action that contrary to other antiseptics the substance retains much of its activity in the presence of animal tissues. For instance, 0.001 to 0.003 mg. of gramicidin injected into the peritoneal cavity can protect mice against 10,000 fatal doses of pneumococci or hemolytic streptococci introduced by the same route. However, the same substance when injected intravenously, subcutaneously, or intramuscularly fails to protect mice against infection with the same organisms. It is possible that the presence in serum of the phospholipid cephalin which, as stated above, is a

specific inhibitor of gramicidin, may prevent any protective effect of the substance in systemic infections. To date, all positive results obtained with gramicidin against experimental infections have concerned the localized treatment of localized infections; the successful results obtained in the treatment of bovine mastitis also confirm this view. Bovine mastitis caused by group B streptococci remains localized in the udder and it has been found that the injection of gramicidin directly into the infected quarter through the teat canal often results in the permanent disappearance of the streptococci.¹⁰

Much remains to be found about the physiological activity of gramicidin both upon the bacterial cell and in the mammalian organism. Pertinent to our discussion is the fact that gramicidin is not equally toxic for all bacterial cells. It is, for instance, highly bactericidal for pneumococci, streptococci, staphylococci, diphtheria and diphtheroid bacilli, aerobic and anaerobic sporulating bacilli, but practically inactive against the influenza (Pfeiffer) bacillus, the colon bacillus, dysentery, typhoid and paratyphoid organisms, and the pneumo-bacillus of Friedländer. It is clear, therefore, that gramicidin exerts a selective bactericidal effect on the Gram positive organisms; this is a specificity of a peculiar order, one which is correlated with the staining characteristics of the bacterial cell. Since the staining properties are necessarily conditioned by chemical and physical characteristics of cellular structure, it is permissible to state that the specificity of the bactericidal agent is related to some structural difference between the Gram positive and Gram negative cell. In this respect it may be of interest to mention that we have recently observed that the endotoxin extracted from dysentery bacilli completely inhibits the action of gramicidin on Gram positive organisms. It is known that many of the endotoxins of the Gram negative bacilli are molecular complexes containing, in addition to polypeptides and polysaccharides, a phospholipid.^{2,11} It is perhaps possible that this phospholipid which appears to be abundantly present in the Gram negative bacilli, may exert upon gramicidin the same inhibitory effect which we have already described for the phospholipid cephalin.

Many antibacterial substances are known to exhibit interesting selectivities with reference to the microbial species which they affect, and one could undoubtedly

interpret these differential activities of different substances in terms of Ehrlich's receptor theory. In any case, enough evidence has already been presented to justify the claim that the rational development of anti-sepsis and chemotherapy has much to gain from a better knowledge of the chemical architecture of the bacterial cell. Because of their minute dimensions, unfortunately, bacteria do not lend themselves to a study by the classical methods of cytology. One may hope, however, to gain some insight into bacterial morphology by a number of indirect methods, such as immunochemical analysis, enzymatic analysis or staining reactions. In particular, it is of importance to gain knowledge of the chemical nature of the cell constituents which are exposed at or near the cell surface and which are therefore vulnerable to the action of toxic agents. We have, in the present discussion, considered only those structures which determine the morphological architecture of the bacterial cell. It will be necessary also to obtain even greater knowledge of the metabolic equipment which determines the physiological architecture of the cell. The work of the English school has given for instance a fascinating insight into the mechanism of action of sulphonamides by suggesting that the effect of the drugs may be due to the fact that they enter into union with some specific link in the metabolic chain of the susceptible cells.⁶ It is only through a complete knowledge of the morphology and physiology of the bacterial cell, that we may hope to develop rational technics for the production of those *charmed bullets* which were the dream of Paul Ehrlich.

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Chronic Gastritis*

A Clinical and Gastroscopic Study

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ANACIDITY or achlorhydria is more likely to be evidence of disease of the stomach than any other variation of gastric secretion. Carlson in 1923 stated that there was no disease known capable of inducing true gastric hyperacidity, that pathological deviations in acid and pepsin concentrations were invariably in the direction of decrease. Faber in 1926 concluded that chronic achylia has an exogenous cause and is produced by external factors acting on the stomach, either by direct irritation of the mucous membrane or through the blood circulation by a toxic action on the gastric parenchyma. By 1935 he had clarified his ideas by postmortem and other histologic study to the extent of considering anacidity to be the result of a disorder of the mucous membrane of the stomach, gastritis in its various forms.

The incidence of achlorhydria increases steadily throughout life. The early figures of Vanzant and associates on the basis of Ewald test meal have been substantiated by more recent work, notably by Polland, using histamine. The incidence of achlorhydria has been given for all ages by Bloomfield and Polland (Ewald test) as 16.9 per cent; and by Polland (histamine test) as 12.2 per cent, 14.2 per cent female and 10.8 per cent male. Faber's figures for anacidity are much higher for 1,000 cases in Copenhagen, the total for all age groups was 306 cases; the test meal used was not stated. As a generality, all figures show slightly lower acid values for women, and higher figures for achlorhydria percentage. Histamine tests are available on only 63 children, from ages of 6 months to 14 years, and no cases of achlorhydria have been found. Using other test meals, occasional absence of free hydrochloric acid has been noted, but these can not be considered as statistically significant.

To determine whether there was objective change from the normal in the gastric mucosa of the individuals having histamine proved achlorhydria, 233 such patients were studied gastroscopically. One hundred thirty-two were found to have atrophic mucosa, 44 had superficial gastritis, 34 were normal, three showed hypertrophic changes and in 20 with carcinoma, details of the mucosa could not be clearly defined because of extent of lesion, retained material, hemorrhage and other causes.

In contrast to the results noted in achlorhydria, may be placed the diagnoses recorded in 100 cases showing acid in the fasting content, serially selected from examinations done while the special study was in progress:

Normal	43
Gastric ulcer	20
Superficial gastritis	12

Hypertrophic gastritis	8
Atrophic gastritis	7
Atrophy and superficial gastritis	3
Gastritis with cancer	1
Carcinoma	6

Single analyses of gastric secretions should not be relied upon as finally conclusive, as shown by results in a group of 88 patients in which the histamine tests were repeated. In 44 patients acid was present on the initial test, and still present on the second test in 41; three of this group, however, had no acid after the second histamine test. Of more interest for the present study were 44 patients, none of whom had free acid after initial histamine test, 23 of whom remained achlorhydric after a second histamine test. Twenty-one, however, showed acid after the repeated test. Thirteen of these had been examined with the gastroscope as being achlorhydric, before the second test was done. Six of these had normal mucosa, one had atrophic gastritis, two had gastric ulcer, one had hypertrophic gastritis with duodenal ulcer and two had cancer of the stomach.

Gastroscopic studies were made in 130 patients with achlorhydria and without evidence of general or gastrointestinal disease by other methods of examination.

The diagnoses in this group were as follows:

Atrophy alone	35
Atrophy with superficial gastritis	34
Atrophy with superficial gastritis and polyps	1
Atrophy with polyps	3
Atrophy with polyposis	1
Superficial gastritis alone	26
Superficial gastritis with polyps	2
Polyposis	1
Hypertrophic gastritis	1
Normal mucosa	25
Normal mucosa with polyp	1

130

It is notable that gastric atrophy was present in 84 cases (64.6 per cent) of this entire group. There is a significant difference in the incidence with which atrophy is found comparing this group and a group of those gastroscopied with free hydrochloric acid present; although it is obvious that such a study does not give an entirely fair basis for statistical comparison. Atrophic changes in the gastric mucosa while seen frequently in patients with free hydrochloric acid in the gastric contents do seem to be much more frequent in those with histamine achlorhydria. The atrophy present has been found largely in the body and fundus with relatively little in the antrum and pylorus. In but one patient in this series was there an atrophic process confined largely to the antrum and pylorus. The atrophic changes in the

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body and fundus could not be distinguished from those found in patients with pernicious anemia, and varied from moderate patchy involvement to diffuse atrophic changes.

Superficial gastritis was also present in a high percentage of the patients in this group (47.4 per cent). We are able to subscribe to the opinion of Schindler and others that in a great majority of cases, atrophic gastritis seems to have developed upon the foundation of a pre-existent superficial gastritis. This is evidenced by the fact that in many instances the two conditions are seen at the same time. It is likely that those patients showing atrophic gastritis only, at the time of examination, may have already gone through experiences with attacks of superficial gastritis. Careful history taken of these patients usually indicates dyspeptic stomach trouble off and on for many years. Faber's histological examinations of young children lends support to the idea that atrophy may result from attacks of gastritis associated with contagious diseases of childhood.

An attempt was made to study the clinical symptoms of patients with histamine achlorhydria who had no other obvious gastrointestinal disease. This is indeed a difficult matter, as it is not possible to rule out gall-bladder and other diseases entirely and the factors of environment, diet, and emotional stress often influence gastrointestinal symptoms as much or more than achlorhydria or the condition of the gastric mucosa.

In this series of 130 there were 18 with the complaint of glossitis, none of whom could be classified as having pernicious anemia. One had Plummer-Vinson syndrome with hypochromic anemia and with an apparently normal gastric mucosa. Nausea was a relatively frequent complaint being present in 45 patients, usually intermittently. Vomiting was present at times in 31 patients. In some of these, nausea and vomiting seemed associated with a migraine syndrome. Diarrhea was a complaint in 18 instances, frequently being associated with alternate predominant constipation. There were a few instances of rather persistent diarrhea which may have been associated with the achlorhydric condition and in some instances there was apparent satisfactory clinical response to the administration of dilute hydrochloric acid with meals. Constipation was the most frequent complaint, being present either constantly or intermittently in 75 of 130 patients (57.7 per cent). Considering the age range of the patients this is probably not much more frequent than in a general group.

This study has further substantiated opinions concerning symptomatology of superficial and atrophic gastritis reported by Carey in 1938. Discomfort or pain of some type was present at times with the majority of these patients. This was variable and very difficult to correlate with the gastroscopic findings. Some complained of hunger and night pain with food relief although this was not a frequent history. In a few such instances superficial erosions were found in the gastric mucosa as a part of a superficial gastritis, and some of these patients were benefitted clinically following increased rest and modified ulcer regime without alkali. A num-

ber of patients also complained of distress after large meals and fatty foods even though the roentgenogram of the gall-bladder was negative.

The therapy for such patients seems to be an individual problem, and it is doubtful if there is any single preferred method of procedure. In many instances rest and attention to dietary bowel management without catharsis has seemed of value. In those with marked superficial gastritis, rest and frequent small feedings have seemed of some value at times. The use of iron, liver, and stomach extracts are advocated in some instances of atrophic gastritis with reports of regeneration of gastric mucosa in some cases. We are unable to draw any conclusions as to such regeneration from our experience at this time.

The symptoms of hypertrophic gastritis are very frequently those characteristic of the ulcer syndrome. But on close questioning, the patients usually complain that they have distress immediately on eating as well as sometime afterwards, and food or alkali ease is not invariable. Many are simply not relieved by food or soda and a few are aggravated thereby. The pain is not discretely circumscribed, does not radiate and rarely occurs at night, contrasted with continuous discomfort of atrophic gastritis; there is periodicity or remissions in the hypertrophic forms, but the total duration of symptoms is not as long. Nausea and vomiting, with relief by vomiting, are much more prevalent than in the ulcer group.

Vomiting in gastritis is the reaction of an intensely and generally irritated mucosa and hence accompanied by pain, nausea and retching, comes soon after meals and gives relief. Vomiting in ulcer is usually to relieve retention caused by obstructive inflammation, scar or spasm at or near the pylorus.

The acid values in patients with hypertrophic gastritis are quite variable, some achylia, most hyperacid, and many normal or anacid. The X-ray gastric study usually results in a diagnosis of some irregularities of ulcer type, either single or multiple; some have been diagnosed gastritis when the mucosal relief seemed characteristic. Occasionally a single niche characteristic of gastric ulcer is described, which when viewed gastroscopically is seen to be only one of multiple ulcerations. The radiologist often indicates hyper-rugation and many times finds the stomach entirely negative.

The impression is very strong that the time spent in carefully developing, classifying and analyzing many so-called ulcer histories will be rewarded. The tendency to accept the patient's original story at its face value or even to simplify it in terms of conventional forms is too prevalent. When a patient says that he has pain after meals, so well drilled is the historian in "ulcer phraseology" that he many times assumes "food ease" without asking. Our experience has been that if the patient be explicitly quizzed on the exact relationship of his distress and means he has taken for his comfort, that a deviation from the classical form will be elicited which will indicate at least the probability of a diagnosis other than ulcer. When, after very careful questioning,

the story seems to be that usually associated with ulcer—namely the food-pain-food-ease sequence—the gastroscopic examination has revealed the ulcerative form of gastritis, or more rarely hypertrophic mucosa with rather deep sub-mucosal hemorrhages. These cases have not been found as commonly, however, as the type showing hypertrophic changes with exudation, superficial hemorrhages and erosions, which give the histories as analyzed above. There are, however, some cases whose history is modified from that of true ulcer, as suggested above, but in whom a typical round or peptic ulcer without generalized gastritis is found on gastroscopic examination; which emphasizes the necessity for such examination in all patients with any sort of gastric complaints in order that a correct diagnosis may be made.

In order that a control group might be contrasted, the records of patients in whom negative or normal gastroscopic findings were recorded were examined. Some of these examinations were done because the clinician wished to eliminate stomach as possible source of anemia, because of laboratory report of blood in stool, or for some other reason, when no gastric history at all was present. In other cases recorded as normal a diagnosis of some other intra-abdominal disease was subsequently made. These patients were eliminated from consideration. The residual cases were almost without exception psychoneurotic individuals with innumerable somatic complaints, of which the gastric symptoms were only a part. Several had migraine, some were air-swallowers, a few had pylorospasm, some with history of vomiting and some with a slight degree of cardiospasm. But there was never an unequivocal history of only gastric disorder. The reference for gastroscopic examination was usually made by the clinician in full recognition of the functional character of the complaint, but because he wished a definite opinion upon which to base his discussion of negative findings with the patient. The essential fact is, therefore, that the history of the patient whose gastric mucosa is found to be normal is not likely to be confused with that of one showing definite changes. He either has no gastric symptoms at all, or such gastrointestinal symptoms as he does present are merely a part of a general psychoneurotic galaxy at the least explicable by globus, aerophagia, cardiospasm, pylorospasm or spastic bowel disturbances. An occasional patient with a well developed psychoneurosis is found by gastroscopy to have an atrophic gastric mucosa; just what the relationship is, is doubtful.

SUMMARY

Superficial Catarrhal Gastritis occurs in young people, has a short history characterized by epigastric distress immediately on eating, not relieved by further food or alkali ingestion. This type of gastritis, if subject to frequent exacerbations, probably results in permanent atrophic changes and eventually occasions the symptoms of chronic atrophic gastritis.

In patients with well established *atrophic gastritis* the history is of persistent, constant upper abdominal distress of pressure type, not relieved by food or alkali, with anorexia and nausea, and occasional vomiting. The

duration is many years. The patients are in the fourth, fifth and sixth decades, and have often lost weight and become anemic, hence to be differentiated from malignancy or pernicious anemia; they may be subject to acute exacerbations, often with sore mouth and tongue.

Patients with *hypertrophic gastritis* have epigastric pain, either immediately post cibum or at an interval thereafter, and have a pronounced tendency to nausea and vomiting, the latter giving relief. The history is of long duration with periods of remission. The type of pain is burning or gnawing, or a dull ache, but does not radiate nor occur at night and is diffuse in upper abdomen.

The radiographic findings in the superficial and atrophic forms of gastritis are usually negative, while in the hypertrophic forms they are equivocal, indeterminant, or show ulcer niche types of defects. Occasionally the diagnosis of gastritis has been made, usually in the hypertrophic type, by changes in mucosal pattern.

There is no diagnostic aid from the evaluation of degrees of acidity of the gastric secretions in the superficial forms; the atrophic forms are distinctly achlorhydric, while the hypertrophic type may be achylic, anacid, hypo or hyper-acid, with a preponderant number of the last.

Evidences of gastric hemorrhage, either hematemesis, or melena has been found with all forms of gastritis, possibly more frequently with the hypertrophic types. Hemorrhagic evidences are strongly indicative of gastritis if another responsible lesion has not been demonstrated.

CONCLUSION

Any stable patient without psychoneurotic stigmata who has a definite, consistent story of some type of gastric distress and in whom neither roentgenographic nor physical examination has revealed characteristic findings, may be given a presumptive diagnosis of gastritis. Gastroscopy in this type of patient is definitely indicated, and if done, will probably reveal some change of the gastric mucosa. If the history has been continuous over a considerable period and has consisted of dull, heavy pressure discomfort, unrelieved by anything he has been able to do, resulting in anorexia and loss of weight and anemia, he may be suspected of having the atrophic form, particularly if he has achlorhydria. If the history has been of long duration but with periodic remissions, characterized by pain occurring sometime in the digestive cycle, either not relieved or aggravated by food and relieved by vomiting, non-radiating and diffuse, the patient may be suffering from the hypertrophic form of gastritis, particularly if radiograms have been indeterminant, negative or uncertain. If the history has been typical for ulcer, but the roentgenological examination has been negative or shown questionable defects, he may have a gastric ulcer or ulcerative, erosive or hemorrhagic gastritis. Finally, critical judgment of the above observations and analyses leads inevitably to the opinion that gastroscopy should be employed as an adjunctive method of diagnosis of gastric conditions.

NOTE: Dr. Maenider Wetherby, director of medical division, out-patient department, University Hospitals, and Dr. R. S. Yivisaker cooperated in some parts of this work.

Hospitalization of University Students

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MOST Student Health Services have two major functions: the prevention of illness and the restoration of the sick to health. To achieve these objectives a Health Service conducts health examinations, secures consultations in the specialties, operates clinics to care for ambulatory illnesses and to dispense health advice, and provides for the hospitalization of ill students. No one of these activities is concerned *solely* with the prevention of illness or the restoration of the sick to health. But practically, several of them are devoted very largely to the accomplishment of one or the other of these two major Student Health Service functions. For example, in our record scheme, clinic visits do not include health examinations and are principally though not wholly concerned with ambulatory illness; health examinations are largely, but not entirely, a preventive medical measure. Thus in our record scheme any statistical statement of "clinic visits" is a rough index of the ambulatory illness among our student body and vice versa health examinations are an index of our preventive medical activities. Consultations can be classified in either category depending upon the viewpoint of the physician seeking the consultation. Hospitalization would seem to be wholly devoted to the care of illness, but if viewed in a broader way it may have a very definite preventive aspect. It is the hope of every Health Service Director to have his Service rise above the level of merely caring for illness alone. He hopes in addition to restoring the ill student to health rapidly, to prevent as much illness as possible.

The St. Louis University Student Health Service was established with the opening of the fall session of 1925-26. The Schools of the University included in the Student Health Service in that year were: Arts and Science, Commerce and Finance, Dentistry, Law, and Medicine with an enrollment of 1,371. Since then the students in Nursing, Education, Social Science, and those engaged in athletics have been made health responsibilities of the Student Health Service. The enrollment, because of these additions and natural growth, has increased to slightly over 1,700 in 1938-39, an increase of about 26 per cent. From 1925 until the close of the 1938-39 school year 8,279 students have had health supervision from the Student Health Service. These students have received 9,276 health examinations, they have been the subjects of 5,487 consultations and the recipients of 2,008 house calls; 1,408 have been hospitalized requiring 12,714 hospital visits by the staff; and they have made 52,972 visits to the Student Health Service Clinic; a total of 82,457 "student-physician" contacts in 14 years.

With this brief explanation we shall discuss these

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various activities as they have been defined and developed in the St. Louis University Student Health Service.

The health examination has been conceived here as a searching study of the peculiar, biological, constitutional "make-up" of a student with his or her own peculiar emotional, hereditary, social, educational, etc., background; searching not only for definite structural pathology in his or her body, but also for habits, emotions, hereditary trends, erroneous ideas of hygiene, etc., which could become the developmental factors upon which future ill health may rest, and finally, on the results of such a study to predicate advice designed to preserve this unique student with unique antecedents from future illness or to minimize its severity. It is quite one thing to determine the absence of structural pathology at a given time and quite another, in addition, to attempt to discover factors which may be a future health hazard and give advice for their correction. This is the essential differentiation between a "physical examination" and a "health examination."

The health examination program at this school has increased steadily in the scope and number of the examinations, and has accounted for a large part of the increased volume of our activity. The average annual health examination load from 1925-29 was 446 as compared with 860 in the last four years. Expressed in rates per 100 students, this is an increase of from 31 to 51. As a health preservation measure the Student Health Service also gives a large number of anti-smallpox, anti-typhoid, and anti-diphtheria immunizations each year. Likewise laboratory studies have been increased from a minimum consisting primarily of a urinalysis, and X-rays, only when indicated. Wassermanns have been routine since 1932 and now the blood count, the basal metabolism, the sugar tolerance, the allergic, the tuberculin and the Schick test, as well as a more extensive use of the X-ray, are the rule.

The preliminary survey in a health examination is the basis for more specialized study either in the form of clinical or laboratory tests, or consultations in the various specialties. The results of the general health examination, the clinical and laboratory studies and consultations are finally "digested" and correlated into health advice, which is presented to the student in a "follow-up" conference.

Consultations are secured to aid either in the preventive medical program or in the care of illness or both. The majority are in ophthalmology, otolaryngology, and dermatology, in the order named. The consultants are selected from the members of the various departments of the Medical School Staff. They are all clinicians engaged in the private practice of their various specialties, and are, therefore, more "disease conscious" than "health minded." We feel that the type of consultations

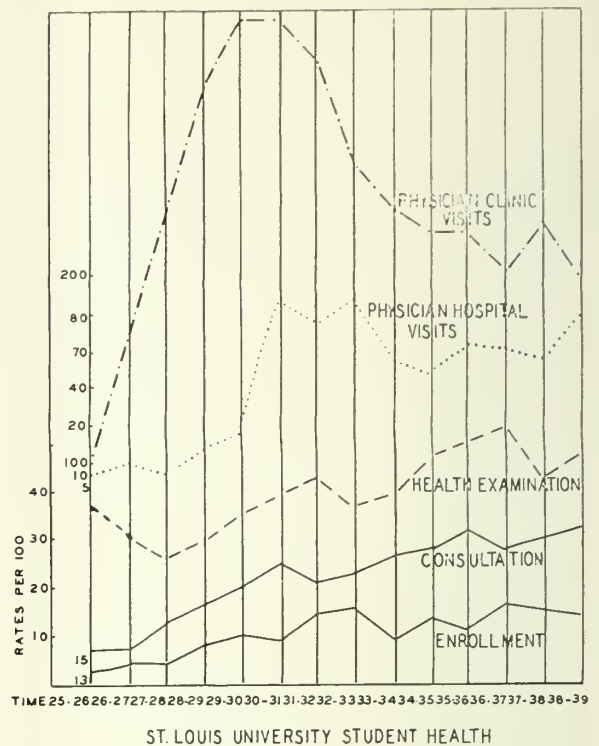
most desirable in a Student Health Service could be best secured if the consultant were made an integral part of our staff where he could by "absorption", association, and training be made "health minded." However, the failure to secure these consultations would be a severe blow to the health service program. Consultations have increased in a steady and uniform manner from 102 (7.4 per 100 students) in 1925-26 to approximately 600 (34.9 per 100 students) in 1938-39.

Student illness is cared for either in the clinic, the hospital, or in the students' lodgings, and constitutes the major portion of the activities of the Health Service. The staff of the Health Service has made house calls whenever it was deemed necessary to determine the seriousness of a student's illness, or to decide what disposition should be made of the case. After the first or second visit the case is either referred to the clinic or, if too ill for ambulatory care, the student is admitted to the hospital. House calls have never been, and we hope will never become, a major factor in the Health Service activities. They have decreased from an annual average of 185 calls between 1925 and 1929, to an average of 95 calls in the past four years, a reduction of 50 per cent.

The yearly clinic visits to the Student Health Service have increased steadily from 1,407 in 1925-26 to a peak of slightly over 5,000, in 1929-30 and 1930-31. For the next two years the clinic visits declined at about the rate they had increased from 1925 to 1930. Since 1933-34 the curve has dropped more slowly and since 1935 has tended to stabilize at a level of between 3,400 and 4,000 visits annually, or a rate of approximately 200 visits per 100 students enrolled. In 1925-26, the rate was 102 visits per 100 students; at the peak between 1929 and 1932, the rate was 335 per 100 students enrolled. If one compares the annual average for the first four years of the Student Health Service's existence (1925 to 1929) with the last four years (1935 to 1939) the clinic visits have increased from an average of 2,870 to 3,590, or approximately 25 per cent, about the same percentage increase that has taken place in enrollment. Some of the clinic visits are for health advice, but the great majority are for the treatment of illness; thus the curve of clinic visits is essentially a curve of illness.

In the school years 1928-29 and 1929-30, we had mild influenzal epidemics among our students, insufficient in numbers, however, to affect our total clinic visit rates. During those two years we did some experimentation in hospitalization. Cases for hospitalization were selected from dwellings wherever there was any appreciable concentration of students. Our primary motive in this selective hospitalization was to separate the sick from the well as early and as quickly as possible; and secondly, because home nursing care was not always adequate.

We soon discovered that the hospitalized patients did not become as sick, and recovered sooner than unhospitalized patients even where the ordinary home nursing care was adequate. It was also noted that the decreased severity and the shortened duration of the illness was the more marked the *earlier* the patient was hospitalized.



TIME 25-26 26-27 27-28 28-29 29-30 30-31 31-32 32-33 33-34 34-35 35-36 36-37 37-38 38-39

ST. LOUIS UNIVERSITY STUDENT HEALTH

Since most student illnesses are of an acute nature it occurred to us that if this fact was true for one acute infection it might be true for others. So, we have been more and more interested in early and widespread hospitalization of all student illnesses since 1930. From 1925 to 1929 our average annual number of hospital cases was 22. This was at the rate of 1.64 students per 100 enrolled. In 1929-30, the rate per 100 students was 3.28, and it was at this time that our clinic illness rate ceased to rise and assumed a plateau shape. From 1930 to 1933, our hospitalization rate averaged slightly more than 10.4 per 100 students enrolled. During this three year period our clinic illness rate fell as sharply as it had risen in the years prior to 1929. Since 1933 our hospitalization rate has stabilized itself at an average of approximately 130 cases per year or at a rate of 7.4 cases per 100 students enrolled. Our clinic illness rate has very closely paralleled our hospital illness curve.

The number of health examinations has increased somewhat more rapidly than the increase in enrollment. But when plotted and compared with our illness rates there does not seem to be any direct correlation. The curve of the annual consultation rate very closely approximates that of the health examination. I do not mean to imply that our health examination and consultation program does not have any health preservation value, but rather that it is difficult to evaluate it in quantitative terms, for we do not possess any good "yard-stick" or control group with which to compare it. The curves of the increase in enrollment, health examinations, and consultations, are all very similar and do not seem to have

any very definite or direct correlation with that of our illness rate. There is, however, a correlation between clinic visits and hospitalization which seems to be significant. As the hospitalization curve increases the clinic visit curve rises less steeply, becomes plateau shaped, and finally declines.

In searching for the explanation for this rather widely fluctuating illness curve which bears no evident relationship to the increase in either enrollment, health examinations, or consultations, we have considered a number of factors. There is undoubtedly an increasing utilization of any new service up to a certain saturation point. And, I suspect that to some extent our rising curve of illness from 1925 to 1929 is due to the students becoming more familiar with the Health Service and its facilities, and that they were using it more freely. However, if this was the sole explanation, one would have expected the curve to have stayed more or less constant after reaching its peak instead of showing a 35 per cent decline. In the years 1930-31, 1931-32, and 1932-33, there were more acute respiratory infections than there have been before or since in our student body. But this occurred after our clinic illness curve had already reached a plateau. In fact, in 1931-32, there were more acute respiratory infections than in the year preceding or following. And in that year the clinic illness rate had shown a sharp decline. Since there were no other epidemics I do not believe this illness inflation was primarily affected by these epidemics. It is self evident that it has no relationship to any wide fluctuations in enrollment, for the latter has shown a slow and constant increase. Nor has there been any decrease in the percentage of the student body utilization of the Health Service which could account for the decline in the illness rates after 1931.

At first glance one would be inclined to say of course your clinic treatment rate has declined because cases previously treated in the clinic are now treated in the hospital, and you have merely shifted your illness from the clinic to the hospital and you really are treating just as much illness as before. When, however, one combines clinic physician visits and hospital physician visits, our total illness treatment rate has shown a decrease since 1930. The peak of this total illness load, clinic and hospital physician visits combined was 6,663 or 431 physician visits per 100 students enrolled in 1930. This total

illness load has decreased from the above level to between 4,600 and 5,100 annually, or to a rate of 220 to 300 physician visits per 100 students enrolled since 1933.

If one compares our average annual number of hospitalized cases from 1925 to 1929 with the same average from 1935 to 1939, namely 22 as compared with 130, there has been an increase of 500 per cent in the number of cases hospitalized. If, however, the visits of physicians to hospital patient and clinic in the same two corresponding periods are combined there is an average increase of only 350 per cent, for the average period of hospitalization per student has been shortened. From 1930 to 1933 the hospital days of service averaged approximately one day per student enrolled during the nine months. The average for the past four years has been approximately 0.7 day per student enrolled per nine months.

The two chief objections to early and frequent hospitalization are (1) the expense to the student and, (2) student aversion to hospitalization. The latter is not an objection to the hospital per se, but it is due rather to anxiety about absence from classes. It is often very difficult to convince a student that the absence from class will actually be shorter and that he or she will return to class stronger and better able to work and with less possibility of permanent sequellae, if he or she is hospitalized rather than treated elsewhere. Frequently I have suspected this is an argument to avoid expense rather than a failure to understand. On account of this I have wondered if the University should not consider providing some form of group hospital insurance for University students. It seems this might be secured at a very low rate because of the selected nature and age of the group, and because the illnesses are chiefly acute and of short duration. We believe that although hospitalization of students is primarily for the care of illness, it often contributes materially, though indirectly, to the conservation of health, for the *prompt* hospitalization of a student with an infectious disease tends to prevent the spread of the infection to other students in dormitories, fraternities and boarding houses. It has been our experience that a student's illness is usually *less severe* and of *shorter duration* when hospitalization takes place early in the illness. Thus, the student returns to classes earlier and with better vitality. For these reasons hospitalization of students has been increased yearly and, especially so since 1930.

Therapeutic Procedures in Chronic Rheumatoid Disease*

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THE term rheumatoid disease covers a wide variation of symptoms and findings and means different things to different physicians. This is especially true because of our lack of complete understanding of the cause of such conditions. The terminology of chronic joint diseases alone is confusing, although there has been a tendency toward some agreement on dividing such cases into two main classes as: (1) atrophic arthritis (rheumatoid, infectious, proliferative, etc.), and (2) hypertrophic arthritis (osteoarthritis, degenerative, senescent, etc.). Here too, there is a variation in the use of special types of subheadings as focal arthritis, psoriatic arthritis, Still's disease, menopausal arthritis, traumatic arthritis, arthritis deformans, malum coxae senilis, and a variety of terms relative to spinal involvement as: spondylitis, Marie-Strumpel type, von Bechterew type. Adding to the confusion is the possible relationship of clinical rheumatic fever with chronic joint disease and the frequent association of extra-articular manifestations as fibrositis, myositis, and neuritis. For my own part, I prefer the general term of rheumatoid disease at this time and find that while many cases of chronic joint disease can be placed in a set classification there seem to be far too many overlapping clinical forms to make a diagnostic classification advisable.

The treatment of each patient is very much of an individual problem and depends primarily on two factors: First, there is the evaluation of the severity and extent of the disease process and consideration of its probable future course, which is by no means easy to determine in many cases. Second, there is the consideration of the patient's social and economic circumstances.

It is difficult to evaluate any therapeutic procedures in a given case of chronic rheumatoid disease. There may be periods of exacerbation and remission that are difficult to explain, and the clinical course is often difficult to predict. Many remarkable isolated cures are reported by all manner of therapeutic procedures. When so-called specific measures are employed, it is important to consider that other factors often enter, such as increased rest, better general care, and the psychological effect. A general consideration of therapeutic methods is as follows:

1. *Rest and Regulation of Activities:* This is one of the most important therapeutic factors to consider and varies with each patient. In general, it is usually inadvisable to prescribe complete bed rest for those with chronic rheumatoid disease as this often leads to joint ankylosis and the development of deformities. An ex-

ception to this might be made in the treatment of acute transitory articular or periarticular involvement. It is also important to avoid wet, cold, exposure, and fatigue. The housewife with severe finger and hand involvement should avoid or curtail washing, ironing, and all work with cold water. Excessive trauma of all kinds to involved joints should be avoided as much as possible, and yet the full range of joint motion must be encouraged. Regular hours, adequate sleep, and extra rest periods are often important. Much rest, yet with frequent periods of moderate joint motion, probably is the ideal for most patients with chronic rheumatoid joint disease.

2. *Physical Therapy:* The scope of physical therapeutic methods is so wide that it is impossible to deal in detail with these in a limited discussion of the subject. In some form such therapy is applicable to nearly all patients with chronic rheumatoid disease. Such measures as outlined by Krusen¹ in a recent book include the general methods of thermotherapy, light therapy, electrotherapy, hydrotherapy, and mechanotherapy.

Heat in some form is tried in nearly all cases and may vary from the use of a hot water bottle to extensive spa therapy. It is of interest that a small percentage of patients with rheumatoid disease do not react favorably to the use of heat. Those with well established joint pathology usually get little more than temporary relief from the use of heat, although there are some exceptions. It is often advisable to instruct these patients in the most applicable method for their individual case and rely on inexpensive home methods, as an infra red lamp, a home-made baker or exercise in hot tub baths. I rarely encourage individuals of moderate means to expend any large sum on heat therapy. Fever therapy, which should be carried out in the hospital with close supervision, has seemed of only occasional value for individuals with rheumatoid disease, although it has seemed of much value in the early treatment of gonorrheal arthritis, sometimes in conjunction with chemotherapy.

Light therapy either with sun or ultraviolet lamp has been used in many instances and is probably of value in some cases of chronic rheumatoid disease, although the effects have not usually been significant. In individuals with tuberculous arthritis it is often of great value.

Electrotherapy is used in various ways, many of them of more suggestive than actual value. Diathermy and short wave therapy probably represent nothing more than a rather effective and often expensive method of heat therapy. Histamine iontophoresis has been advocated in recent years, and in our experience has sometimes seemed of value in relieving symptoms especially in individuals with rather localized involvement of the hands or feet.

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Hydrotherapy, especially that representing a combined method of heat and exercise under water has often seemed of value in helping to maintain motion in those with severe chronic joint disease, although it is frequently too expensive a procedure for general use.

Mechanotherapy in chronic arthritis is often of great value in the prevention and correction of deformities. Intelligent use of passive motion is often important as are corrective and postural exercises. Massage seems contraindicated over actively involved joints.

3. *Nonspecific Protein Therapy*: This has been used by two general methods: first, the intravenous use of typhoid vaccine in increasing doses with marked febrile effect, and second, the use of various proteins such as milk and milk products intramuscularly with little or no general reaction. We have not been impressed by these methods in the past, although typhoid febrile reactions have often been followed by a few days of relief and occasionally for longer periods. Hench² has reported three deaths in a series of 1,500 patients treated by this method. Some believe intravenous streptococcic vaccine is also no more than foreign protein therapy, although there is evidence that it is probably more than that.

4. *Vaccine Therapy (Intravenous Streptococcic)*: Vaccines of various types, usually streptococcic, have been used in many ways and in varying doses and routes in the treatment of chronic arthritis. For the past ten years we have used intravenous streptococcic vaccine in a series of more than 4,000 patients with chronic rheumatoid disease. The basis for this has been reviewed in previous publications.³

The technic employed has been to give eight injections of intravenous streptococcic vaccine at one week intervals, beginning with 100 million and increasing by 100 million each week, giving 800 million for the eighth dose. If apparent clinical improvement is present, such a dose is continued at two to four week intervals; if not, there may be a further trial with larger doses.

A series of 1,192 patients were treated with vaccine alone (no other therapeutic suggestions) with clinical improvement reported as definite in 75 per cent, questionable in 10 per cent, and absent in 15 per cent. Improvement when present usually seemed evident after three to eight weeks, although in a few it was present only after further therapy and larger doses. Chronic spinal involvement has seemed especially slow to respond and improvement has been evidenced in some cases only after a trial of six months to a year. Individuals with well established chronic joint disease are rarely completely cured, and treatment may often extend over a period of years at four weekly intervals. The infrequency with which these patients have shown significant progression of their disease process has seemed impressive but is hard to evaluate.

As a further check on the therapeutic value of intravenous streptococcic vaccine therapy, a blind control series of 80 cases that could be termed as having "rheumatoid arthritis" were treated alternately with unknown solutions either vaccine or normal saline solution. In this group 33 of the 40 receiving vaccine (82.5 per cent)

seemed definitely improved. In the control group receiving saline, 16 of the 40 (40 per cent) seemed definitely improved. This is a significant difference in favor of the group receiving vaccine; however, the fact that 40 per cent receiving saline alone seemed improved, emphasizes the way in which many procedures have given apparent excellent results in individual cases. This emphasizes the need for consideration of such factors as: (1) the normal variations in the course of this disease, (2) the psychotherapeutic effect, and (3) the increased rest and better general care often attendant with any effort to improve.

Intravenous streptococcic vaccine is obviously no cure-all, nor is it effective in all cases, but it has seemed of distinct value in combination with other indicated procedures in treatment of chronic rheumatoid disease. A more detailed report of its use has been recently published.⁴

5. *Drug Therapy*: A number of therapeutic agents have been advised in the treatment of chronic arthritis as having possible specific effect. Patients with chronic rheumatoid disease who have not responded favorably to intravenous streptococcic vaccine have furnished a critical group for trial of such procedures. Colloidal sulfur, bee venom derivatives, chaulmoogra oil, and massive vitamin D therapy (200,000 to 300,000 units per day) have all been tried by us with essentially negative results. The sulfonamide drugs have been tried by a number of physicians in chronic rheumatoid disease without favorable clinical effect. Some of the more recent drugs in this group have not yet had adequate trial.

Gold salts alone, of all the possible specific drug therapy, have seemed of clinical value in treating chronic rheumatoid disease. Forrestier⁵ first introduced their use in France and since then they have been used extensively in England⁶ and more recently in this country.

Unfortunately, the use of gold salts is not without danger. Some of the undesirable effects are (1) skin and mucosal reactions, notably exfoliative dermatitis, (2) blood reactions as purpura, agranulocytosis, and anemia, and (3) liver damage with associated jaundice. There are a number of other less frequent or less severe toxic effects. In the first 40 patients treated in our Outpatient Clinic with conservative doses, we have had five cases of exfoliative dermatitis and one case of marked neutropenia. Hartfall, Garland and Goldie⁶ reported a mortality rate of nearly one per cent in a series of 900 patients treated with rather large doses.

There are a number of commercial gold salt preparations on the market. We have used chiefly gold sodium thiomalate (myochrysin). A series of 20 weekly injections of .025 grams has been given (in a few instances up to .050 grams). In most instances if significant toxic manifestations were not present a second course of 20 weekly treatments has been given after a two month rest period. We have followed hemoglobin and leukocyte counts each week and urinalyses at less frequent intervals. Individuals with liver disease, kidney disease, pregnancy, or blood dyscrasias were not treated.

The clinical results from gold therapy have been encouraging in a number of cases, although like vaccine it has only occasionally been followed by a clinical cure when used in patients with a well established arthritic process. It is to be hoped that a less toxic gold product can be found, although the English group have tried a large number of gold salts with no great difference in toxic effects. Recently, Sabin⁷ suggested the trial of gold calcium thiomalate based on less toxic effects observed in mice. Our criteria for the trial of gold salts therapy at this time are as follows: (1) the patient has severe rheumatoid disease, (2) an adequate trial of intravenous streptococcic vaccine has been used without benefit or with inadequate benefit, and (3) the patient is fully advised of the dangers of treatment and assumes the full risk of treatment.

Other drug therapy to be considered, is the use of drugs for the relief of pain. Acetylsalicylic acid and others of the salicylate group often give some degree of relief and permit a greater degree of motion and should be used freely when effective. In some instances acetphenetidin or phenacetin seem more effective. The cincophen group because of toxic liver effect should probably be avoided unless there is a complicating gouty process. Sedatives are at times of value both in small dosage through the day as phenobarbital, $\frac{1}{2}$ grain three times daily, for the nervous, irritable arthritic patient, or in combination with salicylates to promote sleep at night. The arthritic patient with secondary anemia is often benefited by the use of ferrous sulfate, 15 to 20 grains per day. Narcotics should be avoided except under exceptional circumstances. The danger of addiction is too great in such a chronic disease and the threshold of pain seems lowered by their use.

6. *X-Ray Therapy*: This has been advocated especially in the treatment of localized areas of involvement rather than for those with diffuse extensive disease, such locations as the low back, especially where due to fibrotic involvement or in acute or subacute involvement about the shoulder or bursa. An excellent review of this subject is given by Kahlmeter of Stockholm⁸ who discusses details of technic. Our own experience with X-ray therapy has not been extensive nor have the results been spectacular in most cases.

7. *Climatic Change*: This method of treatment is obviously for the few. Desert country such as in southern Arizona is most frequently recommended. This is usually combined with increased rest and light therapy. It has seemed clinically more effective as a method of prevention than cure, although a number of individuals with chronic rheumatoid disease have been apparently benefited by a prolonged stay (6 months to 2 years) in Arizona. The obvious disadvantages of this treatment are the serious social and economic sacrifices so often required.

8. *Psychotherapy*: This may be important in many individuals and is a form of therapy unintentionally given with any planned system of treatment. The encouragement of the patient and a hopeful outlook may be factors of great therapeutic significance. Faith heal-

ing and practices closely allied to them have seemingly benefited many individuals with chronic rheumatoid disease, probably because many patients have exaggerated their complaints out of proportion to the underlying disease process.

9. *Dietary and Vitamin Therapy*: There are numerous reports of special diets for chronic arthritic patients and many more informal popular notions. In our experience, we have found no diet to be of special general value. We have advised a good general adequate diet without special restrictions. Chronic constipation is common with many patients, and we have encouraged dietary management by the use of adequate cooked bulk (fruits and vegetables) in most cases, coupled with a regular habit time. The obese arthritic patient with involvement of the lower extremities or the back is often markedly helped by an adequate reduction diet. The underweight, badly nourished patient is given extra caloric intake and five meals per day.

We have found no special value in the administration of vitamins far beyond known probable requirements. Where known vitamin deficiency is present, vitamins are added, as in the use of A and D with the reduction diet and at times in the use of brewer's yeast in the undernourished arthritic patient.

10. *Focal Infection*: The role of possible foci of infection in chronic rheumatoid disease is the subject of much controversy. There are some strong proponents of the theory of radical elimination of possible foci, although in recent years there is a much more conservative trend. Cecil and Angevine⁹ found little basis for the correlation of alleged foci of infection in their study of 200 cases with "rheumatoid arthritis." Reimann¹⁰ has likewise been critical of the significance of focal infection in systemic disease. In our experience, we have had little reason to advocate radical procedures in the patient with chronic rheumatoid disease. It seems especially inadvisable to prescribe the wholesale extraction of apparently normal teeth. The patient with well established joint disease seems rarely benefited by removal of any obvious sources of local infection. The patient with early or transitory joint pain may be benefited by such procedures, although it is difficult to be sure of the therapeutic effect in such cases. Our procedure has been to advocate removal of tonsils in patients with definite recurrent tonsillitis or extraction of obviously abscessed teeth, although we are unable to draw any definite conclusion as to the effect of such removal. We have given a course of eight injections of intravenous streptococcic vaccine prior to such excisions, believing that it might prevent the occasional violent flare-up in clinical activity.

11. *Endocrine Therapy*: Thyroid extract has been used in the regulation of those occasional arthritic patients with hypothyroidism. Women with joint and muscle pain at the time of menopause are often given some form of replacement therapy. There is some doubt that this is always a definite rheumatoid condition. The value of such therapy in those with a definite arthritic

process is less definite although it does at times have some apparent beneficial effect.

12. *The Prevention and Correction of Deformities:* This is of much importance and is a matter for individual management in each case. Physical therapeutic methods are important here. One of the commonest deformities to prevent is the flexion deformity at the knees and the patient with knee involvement should be encouraged to extend the legs at the knees at intervals every day. When flexion deformity has already developed, it may be necessary to use light sand bag saddles over the knees four or five times per day. Casts, appliances, and operative procedures are of great value in some cases.

SUMMARY

The management of the patient with chronic rheumatoid disease is an individual problem. We have many therapeutic methods at our disposal. This condition is by no means a hopeless one, and only a small percentage of patients develop severe crippling deformity. Under careful management, this percentage can be reduced even

further and life made more agreeable for the majority of those less severely involved.

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Spontaneous Pneumothorax of Unknown Etiology

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SPONTANEOUS pneumothorax is not an unusual phenomenon. It may occur as a complication of a pre-existing disease or it may occur without evident cause in young adults. Spontaneous pneumothorax was early recognized as a serious complication of pulmonary tuberculosis and for many years every spontaneous pneumothorax was assumed to be tuberculous unless other definite underlying pathology could be demonstrated. With the more common use of tuberculin tests and of roentgenological examinations of the chest it is now recognized that many non-tuberculous spontaneous pneumothoraces occur. They occur frequently in young adults and particularly in men between the ages of 15 and 35. The majority of college students are included in this group. An uncomplicated non-tuberculous spontaneous pneumothorax is characterized by its sudden onset in an apparently healthy individual, by its absence of constitutional symptoms and by its benign course.

Kjaergaard¹ followed the course of 49 cases for from five months to eighteen years after the occurrence of their pneumothoraces. Three died, one of tuberculosis and two of pneumonia. The patient who died of tuberculosis gave a history of definite exposure to tuberculosis after her pneumothorax. Kirshner² reported 24 cases of spontaneous pneumothorax occurring in apparently healthy patients. Three of these patients were found to have tuberculosis with well pronounced disease.

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Twenty-one showed no evidence of tuberculosis on careful study. Leggett, Myers, and Levine³ collected 31 cases of spontaneous pneumothorax from their records. Sixteen of these cases gave no evidence of clinical tuberculosis. Perry⁴ reported 114 cases of spontaneous pneumothorax. In 85 the pneumothorax had occurred in apparently healthy individuals. Fifty-five patients when re-examined showed no evidence of tuberculosis. Twelve others who were not re-examined were reported to be in good health. Of 250 cases which he found recorded in the literature only six, or 2.4 per cent, later developed tuberculosis. Blackford⁵ reported 15 cases among college students. Fourteen were in good health eight months to fifteen years after the occurrence of a spontaneous pneumothorax. VanOrdstrand and Scott⁶ collected 49 cases from the records of the Cleveland Clinic. Among the causes in 29 cases were listed: silicosis, pulmonary fibrosis with emphysema, asthma, lung abscess, pneumonia, atelectasia, tumors, and osteomyelitis of the rib. In ten cases the cause given was tuberculosis. In ten no cause could be found.

The evidence indicates that patients who have had a non-tuberculous spontaneous pneumothorax are neither more nor less susceptible to tuberculosis than others of the same age and sex. The incidence of subsequent pulmonary tuberculosis in the group compares favorably with the average for their age and sex.

The usual benign course of non-tuberculous spontaneous pneumothorax makes autopsies on these patients rare. In most cases where autopsies were performed, death was the result of some other cause. The most frequent cause of non-tuberculous spontaneous pneumothorax shown at autopsy has been rupture of an emphysematous bulla. In most cases the emphysema is localized and is the result of the formation of valve vesicles. Kjaergaard¹ believed that the rupture of a simple emphysematous bulla was rare and that in most cases the rupture occurred when there was a valve-like obstruction which prevented the return of air from the bulla to the lung. Kjaergaard⁷ reported two autopsies in which spontaneous pneumothorax was found to be due to the rupture of such valve vesicles. Hayashi⁸ reported autopsies on three cases of spontaneous pneumothorax. In each case ruptures emphysematous bullae were found. Perry⁴ reported the autopsy on one of his patients with spontaneous pneumothorax who had died of septicemia from a Whitlow. Pneumothorax was due to the rupture of a bulla in an area of localized emphysema. Perry also cites autopsy reports by Wilcox, Foster and Carte, by Rankin, by Fischer, and by Settle where each reports a case of spontaneous pneumothorax caused by the rupture of an emphysematous bulla. Spontaneous pneumothoraces may also result from the rupture of a congenital cyst or from the tearing of a pleural adhesion.

The extent of the pneumothorax may vary from a small localized air pocket difficult to detect even by stereoscopic roentgenograms to complete collapse of the lung and tension pneumothorax which may cause a marked shift of the mediastinum. Kjaergaard¹ classifies pneumothoraces as: (a) partial pneumothorax in which only a small amount of air is present; (b) coat pneumothorax where the air pocket forms a thin coat between the lung and the chest wall; (c) total pneumothorax without displacement; (d) total pneumothorax with displacement; (e) tension pneumothorax. In the usual attack of non-tuberculous spontaneous pneumothorax the patient's condition is not serious. However, in a valvular pneumothorax with tension and in hemopneumothorax the patient may show extreme distress and die in a short time unless prompt relief is given by aspiration of air from the chest or by control of hemorrhage.

Numerous cases of recurrent spontaneous pneumothorax have been reported. Wood⁹ stated that 21 per cent of 71 cases of spontaneous pneumothorax seen at the Mayo Clinic gave a history of recurrent attacks. Blackford⁷ reported three of his fifteen cases had recurrent attacks. The healing of a tear in a valve vesicle followed by fresh distension and later by new rupture and escape of air into the pleural sac may be one explanation of the recurrence of spontaneous pneumothorax, or new valve vesicles may be formed because of underlying scar tissue or fibrosis.

Theoretically effort involving compression of the chest might be expected to produce spontaneous pneumothorax by causing the rupture of a valve vesicle. Such cases do occur but are rare. Friesdorf (quoted by Perry⁴)

found that in his 177 cases 20 per cent occurred after trivial exertion, 40 per cent after moderate exertion, and 40 per cent after considerable exertion. Perry felt that deep respiration after a period of shallow respiration might precipitate an attack. In 30 per cent of his cases the attack occurred when the patient got out of bed in the morning, approximately 4 per cent occurred after anesthesia, and approximately 4 per cent occurred when the patient was leaving the cinema. Thirty-eight per cent of Kjaergaard's¹ patients were students, office workers, or clerks, 16 per cent did moderately heavy work, 20 per cent did household work and 26 per cent did heavy physical work.

The clinical history is fairly constant. The patient usually states that he had a sudden sharp pain in his chest which spread to the chest wall, then shoulder, or less frequently to the abdomen. He may complain of shortness of breath following the pain and find that deep inspiration increases the pain. If the pneumothorax is bilateral or if tension pneumothorax is present dyspnea may be severe. Cyanosis may or may not be present. If hemopneumothorax is present the patient may be in shock from the hemorrhage.

The physical findings are those of any pneumothorax and depend upon the size and location of the air pocket. There is an increase in resonance with a decrease in breath sounds and in transmission of whispered voice over the air pocket. If the amount of air is large and if the pressure in the pleural sac is high, the heart may be displaced to the opposite side and there may be bulging of the interspaces on the side of the pneumothorax. If the air pocket is small, physical examination may reveal no abnormality. Roentgenological examination of the chest is an invaluable aid in the diagnosis of spontaneous pneumothorax.

The treatment depends upon the severity of the symptoms and the extent of the pneumothorax. In a partial pneumothorax or even in a complete pneumothorax without displacement, rest in bed for a week or until subsidence of symptoms is usually sufficient. The patient should be warned of the possibility of recurrence and should be instructed to avoid strenuous exertion for several months. If the pressure is causing severe dyspnea or cyanosis it should be relieved by aspirating air from the chest. In simultaneous bilateral pneumothorax immediate aspiration may be necessary. In hemopneumothorax transfusion may be required to replace the blood lost and to decrease the clotting time. Idiopathic spontaneous pneumothorax is rarely followed by an effusion but if an effusion occurs it may be necessary to aspirate the fluid and replace it by air.

The prognosis in uncomplicated cases is excellent. In the majority of cases recovery occurs within a few weeks. Even when the pneumothorax persists over a long period of time it frequently causes very little inconvenience.

In the Health Service at Kent State University we saw three cases of spontaneous pneumothorax between June and October 1939. One patient was a girl age 19, one a boy age 21, and the other a male age 22. All had had negative reactions to tuberculin, and all had had

roentgenological examination of the chest before the onset of symptoms. A brief summary of their case histories is given below:

Patient 1. White female, age 19. Mantoux test May 1938. No reaction to 0.1 mgm. Old Tuberculin. X-ray chest taken February 3, 1938, because of history of failure to gain weight and of frequent chest colds. X-ray showed a small calcified nodule in the right second interspace with calcification of the draining lymph nodes. There was a moderate increase in bronchial shadows in both bases.

Spontaneous Pneumothorax: First attack May 27, 1938. Onset: Patient stated that while walking down the street she had a sudden sharp pain in her left chest. The pain persisted. Since the onset of the pain she has been short of breath. Examination: Left pupil dilated. Increased muscle spasm both trapezii more marked on right side. Questionable increase in resonance over left apex. Breath sounds and whispered voice normal. X-Ray: Small air pocket extending 1.5 cm. from the lateral wall of the left chest above the second interspace. There has been no other change since the previous plate.

Treatment: Patient lived at home. She was instructed to place herself under the care of her family doctor. She was advised to stay quietly in bed for at least a week, after which time she might return for further examination. Outcome: When she returned four days later physical examination was negative except for dilatation of left pupil. X-ray examination showed complete absorption of the air pocket previously noted.

Second Attack: July 24, 1939. Onset: Identical with previous attack. Sudden severe pain in left chest which came on while patient was walking. Dyspnea was more marked than in the previous attack. Examination: Dilated pupil as before. Hyper-resonance over the entire left chest with absent breath sounds except posteriorly where bronchial breathing was heard along the spine. X-Ray: Left pneumothorax with approximately 80 per cent collapse of the upper lobe and 60 per cent collapse of the lower lobe. The collapsed upper lobe seems very dense. Right lung no change from previous plates.

Treatment: Patient was instructed to place herself under the care of her family doctor. She was advised to rest in bed for at least one week before returning. Outcome: Expansion of the lung was much slower this time. X-rays taken August 3rd, 10th and 24th showed increasing expansion of the lung. An X-ray taken September 1, 1939, showed complete re-expansion of the lung. X-rays taken in January, March and June, 1940, showed no recurrence of the pneumothorax.

Remarks: In addition to these two recognized attacks of spontaneous pneumothorax the patient gave a history which was suggestive of similar attacks in April 1936, and May 1939. In May 1939 she again failed to react to 0.1 mgm. of Old Tuberculin.

Patient 2. White male, age 22. Tuberculin Test: Given by the family doctor. The patient is not sure of the type of test but remembers that he was told that the test was negative. Test was applied in the summer of 1938. X-ray chest taken in the summer of 1938 showed no evidence of tuberculosis.

Spontaneous Pneumothorax: First attack August 20, 1939. Onset: While studying patient felt a slight pain in his chest which gradually became more severe. After about an hour he stood up. The pain then became so severe he had to lie down. Examination: August 21, 1939. Patient seen at the office—no record made of examination. Diagnosis, "pulled muscle." August 22nd, patient returned to the office, given heat treatment on chest without relief. August 23rd, returned again. X-ray taken. X-Ray Chest: Right pneumothorax with approximately 50 per cent collapse of the lung. Right diaphragm shadow shows obliteration of costo-phrenic sinus with fixation of the diaphragm at the level of the sixth rib.

Treatment: Patient was sent to the infirmary for rest and observation. Outcome: X-ray taken September 1, 1939, showed marked expansion of the lung. Patient was instructed to return to his home and place himself under the care of his family doctor. X-ray films taken October 17th showed complete expansion of the right lung with no evidence of pulmonary pathology.

Remarks: On October 20th, patient was admitted to the infirmary with a bronchopneumonia involving the right base. His sputum contained type 23 pneumococci. On November 3rd he was discharged to go home and rest. An X-ray on that day showed increased bronchial shadows both bases. There was no recurrence of the pneumothorax. On the day before the occurrence of his pneumothorax this patient had exercised violently. Whether this violent exercise had any connection with development of his pneumothorax, I do not know.

Patient 3. White male, age 21. Tuberculin Test: May 1938, Mantoux test—no reaction to 0.1 mgm. Old Tuberculin. X-Ray Chest: November 11, 1936—showed a calcified nodule in the right seventh interspace with calcification of the draining lymph nodes. There was no evidence of parenchymal infiltration.

Spontaneous Pneumothorax: First attack, October 16, 1939. Onset: While studying in the library patient felt a sharp pain in his right chest which seemed to shut off his breath. Physical Examination: No abnormal findings. Chest taped and patient sent home. Patient returned the next morning still complaining of pain. Physical examination still negative. X-Ray Chest: Right pneumothorax with partial collapse of lung. Primary focus right base noted as in previous X-ray.

Treatment: Patient was advised to consult his family physician and after a week's rest in bed to return for further examination. The family physician sent him to the hospital for six weeks after which time he called in chest consultant who advised him to let the patient up. Outcome: X-rays of the chest taken March 6, 1940, showed complete expansion of the lung. The primary focus in the right base was unchanged and there was no evidence of parenchymal infiltration.

Remarks: In June 1940 this patient passed the physical examination for C.A.A.

CONCLUSIONS

1. Students in college belong to the age group in which spontaneous pneumothorax most frequently occurs.
2. A history of sudden severe chest pain with or without dyspnea should suggest the possibility of spontaneous pneumothorax.
3. In such cases a careful physical examination should be made with a roentgenological examination to rule out the possibility of pulmonary tuberculosis or to confirm the diagnosis of spontaneous pneumothorax.
4. These patients frequently need reassurance as to the probable outcome of their illness.
5. They should be given a period of rest in bed until the subsidence of their symptoms. This period of rest should be taken under the supervision of their family physician or in the hospital.
6. They should not be subjected to long periods of hospitalization but should be returned to active life with the subsidence of their symptoms and the expansion of the collapsed lung.

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Poison Antidotal Kit*

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HOSPITALS and student health clinics are often called upon to treat individuals who have taken poison either by accident or with suicidal intent. On such occasions it is necessary and at times imperative to have antidotal therapy readily available.

With these considerations in mind, a poison antidote kit has been designed. This is a box made of pine wood, measuring 18 x 15½ inches with a depth of 9½ inches. Fully equipped it weighs 17 pounds. The box contains nineteen compartments of varying sizes. Sixteen of these are labelled (in alphabetical order) with the name of a commonly used poison. *Within* each compartment are antidotal or strongly supportive drugs for the treatment of each designated poison. The sixteen poisons are:

Compartment:

1. acids (hydrochloric, nitric, sulphuric, acetic, phosphoric)
2. acids (carbolic, phenol, creosol, lysol, creosote)
3. alcohol, methyl
4. alcohol, ethyl
5. alkalies (lye, caustic soda, potash, ammonia, lime)
6. arsenic
7. barbiturates
8. cannabis (marihuana)
9. cocaine
10. cyanides
11. iodine
12. mercury
13. mushroom
14. nitrites
15. opium
16. strychnine

In addition, compartment seventeen is labelled convulsions (anticipated in strychnine, mushroom or cocaine poisoning). This contains ampules of 15½ gr. each of sodium amylal. The remaining two compartments are labelled (1) syringes and needles, and (2) stomach pump and pharyngeal airway.

In the space provided on the under surface of the lid is an instructional booklet. This presents in a short,

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Poison antidotal kit.

concise manner (1) general instructions for all cases of poisoning, (2) specific directions for the use of the antidotes and supportive drugs, (3) gives the treatment for carbon monoxide poisoning and bromism, (4) informs the reader where perishable items such as milk, lemon juice, eggs, etc., are to be found. (This booklet was prepared with the assistance of Dr. M. H. Seevers, Associate Professor of Pharmacology, Medical School, University of Wisconsin, to whom the author is greatly indebted.)

SUMMARY

1. A poison antidote kit is described.
2. Main advantages—a grouping together of generally accepted antidotes and supportive drugs for the most commonly used poisons. The kit kept in a central place is constantly available for use.

Rowing Method of Artificial Respiration*

M. C. Rosekrans, M.D.

Neillsville, Wisconsin

ON Christmas eve, 1927, at about 5:30 P. M., an emergency case was brought to the hospital. The patient, a medium sized female, about 35 years of age, was in a state of coma. Pulse and respirations were about normal in rate. She had been picked up from a street in the residential district by an ambulance after having been struck by a meat truck which catapulted and skidded her for a distance of about 45 feet over an icy, snowy pavement. A diagnosis of skull fracture was made, and a decompression operation was performed without desired result.

About 7:30 or 8:00 P. M., while being examined by consultants, the patient suddenly stopped breathing. Efforts were made to restore normal breathing, but without success. The patient was in a hospital bed at the time, and the old and now obsolete Sylvester method of artificial respiration was resorted to. Help was called to relieve the rapidly tiring crew on the job. The patient was finally placed upon a wheel stretcher and taken to a spare operating room, where the work could be carried on with greater ease. The patient's condition remained fair, and there was no cyanosis. Excitement soon lessened and the interns from an adjoining hospital were called to help form the necessary crews to carry on the work.

Some of us, who were idling in the room, noticed that there was an appreciable expiratory whistle through the upper respiratory tract prior to pressure over the anterior chest during the interval of lowering the arms from the extended position. It occurred to us that perhaps unnecessary work was being done. We, therefore, obtained a hand mirror, and, when our turn came, dispensed with pressure over the anterior chest, using the mirror to determine if there was an appreciable expiration of air from the lungs. We soon decided that there was, and we dispensed entirely with pressure over the chest; still continuing, however, with an operator on either side. This method was further modified by using only one operator as follows:

The operator seated himself at the head of the table, upon a high stool; he grasped the patient's arms at the wrists and, with a simple rowing technic, drew the arms in extension; after which he allowed them to fall back in flexion over the chest without any pressure. A stop watch was obtained and the respirations regulated, from 12 to 14 per minute. Under this technic, it was possible for one operator to carry on the work for as much as two hours at a time, without relief and without appreciable fatigue. This enabled us to cut the working force down to two or three and to continue administering artificial respiration for approximately 45 hours, when the patient succumbed.

Autopsy revealed a basal skull fracture with dissection hemorrhage into the subdural space, laterally and

*Read at the staff meeting of the Luther Hospital, Eau Claire, Wisconsin, April 14, 1941.

downward into the region of the medulla. Apparently a lowering of the spinal pressure had enabled the hemorrhage to extend downward far enough to embarrass the respiratory center without affecting the cardiac center until near the point of death.

After it had been established that the rowing technic was sufficient to maintain life, further observations were made:

First, short pauses were taken at two or three minute intervals when respirations were ceased. Later the pauses were lengthened enough to permit the operator to walk once around the stretcher. A respiratory rate of 14 to 16 per minute seemed to be more than adequate. The rate was then increased to 18 or 20 per minute to obtain hyperaeration, after which a complete cessation of respirations was held for three minutes before there was appreciable cyanosis and change in the heart rate. Color and heart rate remained normal until the last two hours prior to death, when the patient gradually became cyanotic and the pulse became thready and elevated to 112 to 116 per minute. Muscle tone became gradually less throughout during the last three or four hours of procedure. A rate of 10 to 14 respirations per minute seemed satisfactory.

It is obvious from this case report, as well as from the experience of many of us, that respiratory failure is very startling, to say the least, and requires immediate action if life is to be sustained. Perhaps few of us in our lifetime ever meet the need for rendering artificial respiration. The same may be said for any other emergency; yet we realize that knowing how to cope with an emergency, should it arise, marks the difference between utter frustration in ignorance and the knowledge that we did our best knowingly.

Any accident which causes the cessation of respiration without immediate death calls for artificial respiration at once! Some of these accidents may be caused by drowning, gas, smoke, electric shock, etc. The case recorded above illustrates that there may be other causes, although they are probably rare. Whatever the cause for artificial respiration, once it is started, it should not be stopped until the patient resumes breathing, or it is definitely established that he is dead. Especially important is this warning in the case of electric shock where the doctor may have pronounced the patient dead. Keep on—even the doctor may have misjudged!

This brings us to a brief review of artificial respiration, in general. "Artificial respiration is that type of respiration maintained by artificial means." Following are some of the methods used in the past, and discarded for that used at the present time:

Marshall Hall: Place the body prone, gently press on the back, then, removing back pressure, turn the body on its side and press a little more, repeating this formula

16 times per minute. This has also been called the prone or postural method of artificial respiration. So far as I know, the technic is not used.

Howard's Method: Place the body supine with a cushion under the back, so that the head is lower than the abdomen, with the arms held over the head. forcible pressure is made with both hands, inward and upward, over the lower ribs about 16 times per minute. I believe this method, modified, is still used occasionally in the operating room.

Sylvester Method: Place the patient supine, pull the arms firmly over the head to raise the ribs and keep there until air ceases to enter the chest. The arms are then brought downward to the chest, pressed against it, and held there a second or two after the air ceases to escape. Repeat 16 times per minute. This method is still used, particularly in areas where modern first aid has not been taught.

Schafer Method: The patient is placed in the prone position with forehead on one arm. Straddle across the patient with knees on either side of his hips; press with both hands firmly upon the back with hands over the lower ribs, then raise your body slowly at the same time releasing the pressure with your hands. This is known also as the prone pressure method and is quite universally taught and used at the present time.

It is apparent from the above descriptions that there has been a constant search for improvement in giving artificial respiration. The rowing method was discovered not by search for improvement, but wholly by chance.

Rowing Method: With the patient supine, place yourself at the patient's head. Grasp the patient's arms at the wrists and firmly extend his arms above his head, to raise the chest, keeping them there long enough for air to enter the chest; then rapidly drop the arms back towards patient's chest leaving them there long enough for air to rush out of the chest. Repeat this rowing motion 10 to 12 times per minute.

The rowing method depends solely for its success upon the fact that the arms are extended over the head and the accessory muscles of respiration are brought into play; they are the pectoralis major and minor and subclavius muscles. The arms act as levers of the second class, the weight being lifted that of the chest suspended through the above named muscles. There is no pressure brought to bear upon the body at any point. With the patient in a comatose state, being relaxed as he is, the chest is raised with very little effort. As I said before in the above case report, one operator was able to carry on this rowing motion for two hours or more with perfect ease. The operator may even take time out to change position and to pause for a few seconds from his work.

It is evident from the history of artificial respiratory technic that all but one have become obsolete; and that one (Prone Pressure Method) is now being quite universally taught. Educational films are available together with first aid teams to teach the Prone Pressure Method.

It is also evident to any of us who have had actual experience that this method is not entirely satisfactory for the following reasons:

1. It requires several persons continuously to keep the operation going.

2. It often produces trauma to the ribs and other tissues where the pressure is applied.

3. It cannot be used upon a patient supine on an operating table.

4. It does not readily adapt itself to convenient observation and care of the patient.

5. The procedure is that of entirely negative phase respiratory mechanism throughout, and admits only a minimum amount of aeration.

6. Mechanically, the prone pressure method is unsatisfactory. (a) The mechanism depends upon pressure exerted against the abdominal viscera to force the diaphragm upward and thus produce a slight expiratory phase. The reverse, or inspiratory phase, depends upon the return of the viscera and diaphragm to as near normal position as the entirely relaxed body will permit. Thus the whole procedure allows for only a minimum of aeration.

The Rowing Technic of Artificial Respiration has definite advantages over the prone pressure method as follows:

1. It requires only one operator to keep the operation going.

2. Since there is no pressure applied, and the extension of the arms is within normal limits, there is no chance for trauma.

3. It adapts itself to use under any condition where artificial respiration is necessary.

4. It also adapts itself to convenient observation and care of the patient.

5. The procedure is that of an entirely positive respiratory mechanism throughout, and admits a maximum amount of aeration.

6. Mechanically the Rowing Technic is satisfactory. (a) The mechanism depends upon the expansion of the respiratory cage through the pull of the accessory muscles. (b) The lungs are expanded in a positive phase. (c) The weight of the anterior chest returning to rest causes the expiratory phase. (d) Accessory muscle tone remains satisfactory so long as there is tone in other muscles. (e) The respiratory rate is lower because of greater aeration.

SUMMARY

A case report of skull fracture needing artificial respiration is given. The Sylvester Method was used at first. This was modified to a simpler and easier rowing method, which is described.

The Schaefer and Rowing methods are compared. The statement is made that the Rowing Method adapts itself to use under any condition where artificial respiration is necessary. An exception should have been noted in the case of removing an electric shock victim from a pole, where an anterior-basal-chest-squeeze is used while descending the pole. Drowning cases are no exception since the water should first be drained from the upper respiratory passages before starting respirations. There is also a question of the patient "swallowing" his tongue in the supine position. Did anyone ever see a respiratory failure patient so embarrassed?

What the Public Knows About Health*

Mayhew Derryberry, Ph.D.†

Washington, D. C.

THE large attendance at the New York World's Fair offered an excellent opportunity to learn something about the level of the general public's information on health matters. Accordingly, a "Quiz Corner" sponsored by the American Museum of Health and the United States Public Health Service, and financially assisted by the Carnegie Corporation, was set up in the Medicine and Public Health Building, where World's Fair visitors were invited to test their health knowledge. The public response was so enthusiastic in 1939 that a similar testing program in 1940 was conducted at the San Francisco Fair with the cooperation of the Metropolitan Life Insurance Company. Approximately 100,000 individuals took one of the seven tests given at the two Fairs. The first report on the study will soon be available from the United States Public Health Service.

The seven tests embodied 225 true-false or multiple-choice questions covering a wide range of subjects, including acute communicable disease, tuberculosis, venereal disease, maternal and child health, safety and first aid, personal and community hygiene, nutrition and diet, cancer, heart disease and general physiology. Results of the tests, being analyzed by age, sex, occupation and place of residence, are, in general, encouraging since the average percentage of correct responses is 77. Questions dealing with acute communicable diseases elicited the largest percentage of correct answers, while those having to do with venereal disease, tuberculosis, or the hygiene of teeth and eyes, were correctly answered least frequently.

However, weaknesses in our health education programs are clearly indicated. For example, the tremendous influence of advertisers' propaganda is evident in the high percentages of incorrect answers to questions such as "A person who frequently complains of severe backaches is very likely to have kidney trouble," or "Eating a handful of raisins each day will enrich the blood because they are rich in iron."

Striking sex differences are shown by the data. It has been found that men are less susceptible than women to advertisers' claims and are better informed on physiology, anatomy and sanitation. Women, as might be expected, excel men in answering questions about foods and maternal and child care.

The occupational groupings tested include professional workers, professional health workers, other health workers, the owner-manager group, clerks, skilled laborers, semi-skilled laborers and domestics, housewives, students and others. The relative standing of the groups is con-

sistent for all seven tests. Professional health workers score highest and are followed in order by sub-professional health workers and professional workers in general. The lowest scores are made by laborers, domestics and clerical workers.

Although health workers surpass all other occupational groups, there are a number of questions to which over 30 per cent of them answer incorrectly. Since this is the group on which the public relies for its health information, it is not surprising to find lay groups responding poorly to the same questions.

Of particular interest to the American Student Health Association are the results obtained from student groups. Young children were excluded from the tests; hence the data represent only students 17 years of age or over. On a given test, students usually rank third or fourth among the occupational groups, with a proportion of correct answers slightly above the average for the entire sampling. Students are familiar with methods of communicable disease control, but in questions about tuberculosis they excel only in those dealing with heredity. This is undoubtedly the result of classroom instruction on heredity rather than on the prevention of tuberculosis.

It is encouraging to find that students are much more skeptical than other groups about the extravagant claims of advertisers. They also excel on questions of a purely technical or academic nature such as: "Dentine is a substance found in (a) toothpaste (b) bones (c) teeth (d) chewing gum,"—a matter of little importance in influencing health behavior. This fact would seem to point to the impracticality of health instruction in schools, especially as the data show that students endorse many health misconceptions. For example, on many questions such as the following, students rank lower than the average for the general sampling: "A good remedy for a sore throat is to wrap a sock around the neck," and "If you have a severe pain in your abdomen, it is unwise to take a laxative to relieve it."

That students are not as well-informed as the general public on questions about adults' health problems such as weight control and heart disease, may seem to confirm other evidence that people are indifferent to health problems which have not actually confronted them. At the same time, students are, with the exceptions noted above, markedly inferior to the general public in answering questions on tuberculosis even though tuberculosis is unquestionably a health problem of youth.

Our data have been studied to try to ascertain the extent of success of recent health educational campaigns on tuberculosis, cancer and venereal disease. For example, there were questions about method of spread, prevalence and length of treatment of venereal disease, prevention of congenital syphilis and the ultimate result

*Presented at the twenty-first annual meeting of the American Student Health Association at the University of Michigan, Ann Arbor, December 27-28, 1940. Abstracted.

†United States Public Health Service.

of untreated cases. The test results show that practically all of the visitors to the Quiz Corner know how the disease is transmitted, 80 per cent understand the importance of prenatal treatment of pregnant women and 60 per cent know the final effects of failure to treat gonorrhoea and syphilis. However, an important part of a syphilis-control campaign is emphasizing the necessity for *an extended period of treatment*—barely half of those tested know that it *cannot be cured in ten easy treatments!* Only 16 per cent know the right chemical to combat the disease, but three times as many believe sulfanilamide is the therapeutic agent. Although one might not expect lay persons to have such technical information, the tendency of the man in the street to take sulfanilamide without a doctor's order makes the lack

of proper information a serious menace. Furthermore, knowledge is essential if the public is to be safeguarded against quacks, fake remedy advertisements and dangerous attempts at self-treatment.

The implications of the findings of the study are obvious for us as health educators. We must concentrate on providing material to fill the gaps in the public's knowledge about health. We must improve our methods of disseminating existing scientific knowledge so that the public may have a factual basis for its health behavior. Judging by the interest and enthusiasm shown by professional groups such as the American Student Health Association, and remembering the progress that has been made in the past few years, we feel confident that the challenge will be successfully met.

Book Reviews

Medicine and Human Welfare, by HENRY E. SIGERIST, M.D., D.Litt.; Yale University Press, 1941. Price \$2.50.

Dr. H. E. SIGERIST is one of the outstanding medical historians of today. His contributions to medical history are not static but dynamic, not dead but living. In his writings he concerns himself not only with the dates of the lives of men and their medical discoveries, but his is a far more reaching goal, the honest and sincere attempt to relate historical events with human welfare. To him a medical discovery—be it a fundamental principle or a new drug—is important only as it benefits and improves the general health and well-being of the human race.

Medicine and Human Welfare is a series of lectures delivered at Yale University in behalf of the Terry Foundation.

In the first chapter, with bold sweeps of candor, Dr. Sigerist cuts through the fog of superstition and prejudice with which theology has tried to envelop medicine. For centuries, man found relief from pain and fear and sickness and death in the supernatural. Ignorant of the truth and having no other means man clung to the early religious beliefs that sickness and death were inevitable and caused by evil spirits and demons. Through religion and magic in the hands of the sorcerer priests he tried to protect himself against sickness and death by placating these spirits. Although animal and mineral drugs were known and used they were always part of a ritual in which theology dominated medicine.

Hippocratic medicine was the earliest attempt to break away from purely religious medicine. "Although prayer was good, a man should himself lend a hand."

Then came Christianity, the first to compete with the pagan healing cults, offering the new religion for the healing of both the mind and body. Because of its humanitarian philosophy, more attention was given by society to the many millions of unattended sick, poor and oppressed.

From that time on and even today religion and medicine, although naturally antagonistic, have been counterparts of the same human need, relief from pain and sorrow. Today as in centuries ago, thousands of men and women on their own volition seek healing not from doctors but in the church. Where medicine has failed to give relief or help, prayer is sought to perform the miracles. Thus there are today thousands of devotees of Christian Science, New Thought, the Emanuel movement, etc.

Why, even to this day and among the most educated, does religion have such a strong hold as a healing agent? According to Sigerist it is because during sickness there is a "reversal to primitivism." The sick man becomes primitive not only physi-


cally but mentally. "Elementary fears, age-old views, coming from the depth of the unconscious break through the thin crust of education. Rationalists become mystics, the helplessness of the sick man, the limitations of medical science and the proximity of death explain the relationship between religion and medicine."

In the essay on "The Physician" the author presents an unorthodox point of view of the changing task and role of the physician. He asks that the outmoded traditions of the medical profession—no longer real and practical—should be given up and that a code that is pertinent and fitting to our present day socio-economic thinking and living should be substituted. In this chapter the author warns the medical profession not to worship false gods. Whether he is right or wrong, with candor and with factual arguments he urges that a socialized program of medical service take the place of the present one of rugged individualism. He stresses in no uncertain language that thousands of Americans are needlessly sick and dying prematurely, and that it is the privilege of the poor as well as the rich to secure all the medical care that science can give. He can see only one way to solve the problem of medical economics. The Doctor must be removed from the sphere of competitive business. He should not sell his services upon the open market. He must be liberated from economical bonds. His quarrel with the present system that attempts to fill the much needed gap between knowledge and service is that it is too conservative, that it has not kept up with the change in times. Looking in the direction in which he believes medicine is moving, he sees the general practitioner as the core of the medical profession but in order to survive and render efficient services he will have to have the backing of a health centre or hospital and a group of specialists to whose help and advice he may have easy access. The practice of tomorrow will be group practice. Medicine like education will become a public service. The doctor of tomorrow will be a combination of scientist, social worker and educator, a leader in the program for better human welfare.

Physiology of Micturition, by ORTHELLO R. LANGWORTHY, LAWRENCE C. KOLB and LLOYD G. LEWIS, Sub-department of Neurology and Brady Urological Institute, Johns Hopkins University; 232 pages; Baltimore: Williams and Wilkins Co., 1940. Price \$3.50.

This monograph is a distinct contribution to the study of bladder function, being a concise summary of the many years of work in this field performed by Dr. Langworthy and his colleagues. Experimental and clinical studies of all types of neurogenic bladder disturbances are reviewed, and a complete discussion of existing opinions in the literature is presented.

The two final chapters are devoted to a brief discussion of clinical applications of experimental findings to diagnosis and treatment of the various types of bladder dysfunction incident to neurological disturbances.



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THE SEX STEROID FAMILY

Any measure of clarification in a confused field must always be welcome to the practitioner of medicine. Therefore, the paper by Dr. Hamblen published in this issue is worthy of more than casual reading.

Endocrinology as a science is complex, exasperatingly incomplete, and as yet in its infancy. Particularly is this true in the field of the sex hormones, where in addition to an absence of established physiological guides, numerous trade names have been applied to the same therapeutic agent. Thus with little difficulty one year ago, nineteen different trade names were found designating preparations containing one or more of the estrogenic principles. The same was true in lesser numbers of names applied to substances containing progesterone, androgenic, and gonadotropic principles. Unfortunately in some instances, names similar in appearance and pronunciation designated entirely different substances. Con-

fusion has also been added through the use of the term synthesis, which in one case may apply to the synthesis of one natural estrogen to the other and which, in another case may apply to the synthesis of a gynecogenic substance from foreign materials.

The "Sex Steroid Family" then would seem to be timely. Some study of it will familiarize the busy practitioner with the basic names of the steroid principles, which can then be identified through the maze of commercial nomenclature. A similar effort applicable to the gonadotropes would also seem to be of value.

C. J. E.

HAY FEVER IN 1941

Summer has passed and although our thoughts have turned to the fall of the year, the past season should not be forgotten. Especially is this true for those of us who have allowed ourselves to be guardians of the health

of individuals with pollen allergy. Many of these patients have been extremely ill with hay fever this year. Some have had in previous years very little trouble requiring medical attention. Others have had a mild hay fever each summer, but this year they have experienced one or two rather severe attacks of asthma. A few have employed palliative treatment each year for their sensitivity to pollens and they have been able to get along fairly comfortably. The past season has, however, not permitted a favorable response to the old pet remedies. Individuals treated with specific pollen inoculations have failed to give satisfactory results in the majority of the cases. A few receiving a modified form of specific treatment have been able to go through the past summer with very little difficulty.

What has been wrong? Why has the past season caused so much suffering among those patients sensitive to pollens? No definite answer can be given but it has been observed that the warm weather and frequent rains during August have caused an abundant growth of weeds. There has been a fairly large amount of pollen present in the air most of the time in spite of the fact that the pollen counts published in the local newspapers have fluctuated greatly.

Recently at a meeting of allergists in Cleveland, it was pointed out that the so-called pollen counts are inaccurate. There is, however, no better substitute available at the present time. Furthermore, during the past season there have been sudden changes in the weather with marked disturbances in barometric pressure. Before the onset of the present war, investigations conducted in Europe had proved clearly that rapid fluctuations in barometric pressure accompanying weather variations may aggravate allergic phenomena.

To take care of a season during which there is a large amount of pollen liberated from an abundant crop of weeds associated with sharp disturbances in the weather, the suggestion has been made that the so-called routine method of inoculation should be abandoned. An early start with more inoculations and larger doses than those recommended by the distributors of the material for specific pollen therapy should be employed. This has been done by some physicians during the past year and the results have been most encouraging. In fact, patients receiving this modified form of treatment have constituted practically all of those who have gone through the past season with little or no clinical manifestations of pollen allergy. This may indicate that the whole method of specific therapy must be revamped. It should be taken out of the hands of the office nurse and more closely supervised by the physician who carefully builds up his schedule depending upon the degree of sensitivity of the patient, the abundance of the weed crop and the nature of the weather. It means more work but it is worth the effort when one considers the poor results of hay fever therapy for the season of 1941.

A. V. S.

'THE JOURNAL-LANCET LECTURESHIP'

In this issue of the *JOURNAL-LANCET* appears an article by Dr. Rene J. Dubos, which is in a somewhat abridged form the substance of a lecture he presented at the University of Minnesota. The *JOURNAL-LANCET* has provided for an annual lecture at the Medical School on any subject the Faculty members desire and by any person they select. This lectureship, together with a number of others with different sponsors, serves to bring to the Medical School persons who are foremost in various phases of medicine and, thus, the students and Faculty are kept informed of the advances being made in medicine in other parts of the country before they are announced in the medical and scientific journals. Dr. W. P. Larson, Chief of the Department of Bacteriology, selected Dr. Dubos to deliver the first *JOURNAL-LANCET* lecture and the Editorial Board is pleased to present this paper to its readers.

J. A. M.

CRYING, LAUGHING, AND SWEARING

Crying rooms are now standard equipment in modern movie theaters. To these, mothers may retire with children whose tantrums might otherwise disturb the rest of the audience. The rooms are so constructed that the mother can see the stage performance through a glass pane and also hear by means of a relayed loudspeaker. Sounds from the crying room do not reach the regular theater audience.

Whining, sniveling, and crying are usually looked upon as most unattractive manifestations, portraying weakness and a defeatist attitude. Children who are tired, irritated, or in pain (as from teething) may be excused for such conduct, but never before has crying been defended as a manly attribute.

Now comes Dr. Arthur N. Foxe of New York with the statement that crying should have a place in the medicine chest. Dr. Logan Clendenning of Kansas City agrees with him and questions the kind of stoicism which is present when there is no real need for it. He says, "Why shouldn't a man cry at his son's wedding? Why shouldn't you cry at the movies? That is why you go there. It is just as good as an aspirin or a teaspoon of magnesium sulfate."

Crying may serve a useful purpose. A bereaved mother may well seek relaxation through capitulation to the well springs of her emotions. The male of the species may also benefit by the shedding of a psychogenic tear now and then. But there are types of crying of which we do not approve. There is the crying that is put on for effect, crying to get one's way, and the crying that is a part of hysteria. These are sufficient examples without dragging into this discussion the crying jag that might have some defenders among the soporific therapy group who advocate alcoholic euthanasia. The benefits of any of these are doubtful.

But coming back to crying rooms in theaters, we are intrigued to speculate on the next innovation of refinement that our aesthetic natures will demand. Certainly laughter has spoiled more pictures for individual listeners

than crying, and we nominate as the next addenda a laughing room. And, if we do not get that pretty soon, we shall have to have a swearing room where blasphemy may have free expression on the part of those who have missed salient points of the show because of outbursts from the laughing group. Far be it from us to advocate

profanity, but we must recognize the fact that many persons are addicted to this habit; and if crying is to be recommended as a relaxing agent, then public laughter and swearing might be considered necessary evils in relieving pent-up emotions.

A. E. H.

Book Reviews

(Continued from page 424)

The Mask of Sanity, by HERVEY CLECKLEY. 294 pages. St. Louis: C. V. Mosby Company: 1941.

When the Quaker confided to his wife that "all people are queer, except thee and me and sometimes I think that thou art a little queer," he probably alluded to the common entity which is discussed in *The Mask of Sanity*.

Cleckley's book is about madmen, with a plot rather crazy and characters either villains or screwballs. Whether the characters are labelled psychopathic, neurotic, psychotic, anxious, sensitive, depressed, excitable, compulsive, mean, weak, criminal, sexually perverse, hysterical, fantastic or impulsive, they are all "madmen". On page 268 the author lets the cat out of the bag, when the chief villain is exposed as "semantic dementia."

Most psychiatrists believe that the psychopathic personality to be explainable by constitutional inferiority. The author believes this clinical entity to be the result of intrapsychic conflicts. Contrary to accepted opinion that such a person is sane, he thinks that for all practical purposes he is insane. To him this social menace is not a mere neurotic nor a feeble-minded person, but plainly and unquestionably a psychotic, because he is incompetent and incapable of carrying on the usual activities of life without constant supervision. Whereas other forms of insanity manifest outward and frank signs, the person with "semantic dementia" conceals his insanity behind a mask of sanity.

With singular candor, the author confesses that "semantic dementia" is very little influenced by therapeutic effort. Treatment along analytic or re-educational lines has been very discouraging. Neither has long confinement in psychiatric hospitals nor prison terms influenced these personality disorders. The newer method, such as shock therapy with insulin or metrazol, or the more drastic and dangerous "bilateral prefrontal lobotomy" he believes worthy of trial.

General semantics, which has for its purpose the complete re-orientation of the patient, seems very speculative at the present time and completely outside the range of the general practitioner. A practical contribution in therapy is offered, namely, to segregate and confine permanently all these persons in a separate institution, to start from scratch and search for new causes and new pathology in the hope of discovering new methods of treatment.

To the general practitioner who for an adventure in confusion prefers a highball to dialectics the reviewer suggests chapters 22 to 25.

Methods of Treatment, by LOGAN CLENDENING, M.D., clinical professor of medicine, University of Kansas, and EDWARD H. HASHINGER, M.D., clinical professor of medicine, University of Kansas; with collaborators; seventh edition, 997 pages; St. Louis: C. V. Mosby Co.: 1941.

Changes in the eleventh edition of the *U. S. Pharmacopoeia* and the recent discoveries in chemotherapy are responsible for the present revision of this well known medical text. The work represents the practitioner's view of pharmacology. It explains the forms of therapy favored by one of the leading exponents of the art of medicine.

CLENDENING'S facile pen endows the work with a literary sparkle. There are innumerable selections worthy of quotation: "Surgery does the ideal thing—it separates the patient from his disease. It puts the patient back to bed and the disease in a bottle." His interest in the history and philosophy of medicine appears throughout. The book is much more than a description of which drugs to use in what diseases; it provides a rational approach to the problem of therapeutics; it deserves the title "Clendening's Philosophy and Art of Medicine."

Medical Nursing, by HULL, WRIGHT and EYL; Philadelphia: F. A. Davis Company, 1940.

This book, written by a doctor, a nurse, and a dietitian, presents the combined viewpoints in a concise, adequate and interesting manner. The aim of the authors, as stated in the preface of the book, is to impart to the student nurse an understanding of the principles of general medicine; to furnish her with a brief yet accurate description of the important diseases which fall within the realm of internal medicine; and to indicate the medical treatment, nursing care and dietary management of these diseases.

The material is presented in outline form. The diseases are discussed according to body systems. An adequate anatomical explanation is given for each disease disturbance. Each symptom is explained on the basis of the actual anatomical, physiological, or emotional involvement.

The illustrations are good. The authors have used many photographs and X-rays of patients to illustrate the disease process.

This book gives therapies that have recently been discovered. One example is the use of Prastigmine in the disease myasthenia gravis. It is possible to go on at length describing the good qualities of this book, but it is sufficient to say the authors seem to have accomplished their purpose. The correlated references at the end of most chapters add to the value of the book for student nurses.

THE JOURNAL-LANCET with Booth No. 170 at the International Medical Assembly, and publishing offices at 84 South 10th St., four blocks from the convention hall, extends a cordial invitation to all visiting physicians.

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TRANSACTIONS OF
THE MINNEAPOLIS ACADEMY OF MEDICINE

(Minneapolis Clinical Club)

Founded January 17, 1920

Stated Meeting Held at the Minneapolis Club, Thursday, April 10, 1941
The President, Lawrence R. Boies, M.D., in the chair

NON-PENETRATING INJURIES OF THE HEART

HORATIO SWEETSER, JR., M.D.

(Summary)

The possibility that the heart may be injured without injury of the chest wall has been recognized for many years. The frequency of such injury has been questioned. The diagnosis of such injury has been, and is difficult. Since the common recognition of damage to the heart in coronary disease, traumatic damage has come to be considered still more rare and chest trauma is likely now to be considered a mere coincidence with all heart muscle injury due solely to pre-existing coronary sclerosis which happened to cause a myocardial infarction independently at about the time trauma occurs. The importance of the subject has increased greatly with the increased mechanization of life in peace and in war, on the highway, and in the shop. A study of twelve autopsy cases and three clinical cases is reported in an attempt to delineate a clinical picture which may differentiate these two conditions.

DISCUSSION

Dr. MOSES BARRON: I would like to ask Dr. Sweetser a few questions. I would like to know what the relationship is between the accident and the myocardial changes as shown by the electrocardiogram. This history which the patient gave me was quite different from that presented tonight. He told me that he had been struck in the chest by the cake of ice which weighed 70 pounds; this apparently did not bother him at once but later he noticed shortness of breath in climbing stairs while carrying on his routine work. He was laid off for a little while by his doctor and was sent to me for a checkup before he returned to work. What brought on the disability in this case?

In the second case I would like to ask what was the relationship between the accident and the symptoms which developed twelve weeks later. How was the thrombosis which apparently happened three months later, connected with the accident?

Dr. JAY C. DAVIS: I think there is no question about the injuries that result to the heart in these accidents. I do not think that any of the electrocardiograms shown tonight are diagnostic in any way as being the result of an external blow on the chest. Any one of the patients discussed tonight might give the same electrocardiographic picture in coronary disease or coronary occlusion. The lack of electrocardiograms shortly before and shortly after injury makes it difficult to state that the changes in the tracing are due to injury to the heart from a blow on the chest. Repeated electrocardiograms beginning shortly after the accident might be of considerable help in some patients.

Dr. NATHANIEL LUFKIN: Dr. Sweetser's paper is timely. Pathologists frequently see at postmortem cardiac injury of the type to which Dr. Sweetser refers. Very recently I observed an injury of the heart which was the result of a fall from a height. There was a two centimeter tear in the posterior wall of the endocardium of the right ventricle near the base. The muscle fibers of the ventricle were also torn but the injury did not involve the epicardium. It is unlikely that this injury was incompatible with life, and it is quite possible that such an injury could manifest itself clinically.

Dr. MOSES BARRON: In one of the cases cited there was a large tear in the right auricle while at the same time there was no external evidence of trauma. How did the perforation of the auricle occur?

Dr. HORATIO B. SWEETSER, JR.: I brought this up as a controversial subject. It is in the same position that coronary disease was, twenty years ago. It is a condition that we do

definitely find. When I started talking about this two or three months ago, most people thought I was crazy, but my impression was that if you looked for such cases you would find them. That is why I went over and looked at the autopsies. There was no other cause of death in this girl that had the perforation of the auricle. That was the only lesion there was. The only way that I could see that it had occurred was that she had had her chest squeezed and the wall of her heart blew out just as you would squeeze a toy balloon. Last night I thought I might demonstrate a little more adequately so I got a lot of little paper bags, held them over the sink after filling them with water and then slapped them with the flat side of a paper cutter. The first time I didn't slap them hard enough and the second time I had water all over me,—they ruptured not where I hit them but on the back.

What kind of lesions, what could have happened to the first cases, what kind of injuries could occur to their hearts that would give shortness of breath later? I think any one of these things; an intramural hemorrhage from a bruise, particularly if it involved the right myocardium would cause difficulty, especially if it involved the distributing tissue.

Dr. Davis asks about coincidence. These cardiograms do occur in people who come in at any age at all, one patient 19, one patient 21, and they varied from there up to 60. Morris and Atkins take up the comparison in infarcts in hearts, they found that in location there was no difference between location whether they did have a coronary artery or whether they hit the heart with a mallet. In the size of the lesion there was no difference. In gross appearance, the contusion gives greater or more severe hemorrhagic derangement.

The coincidence of old and recent injury may be of help but even that is not conclusive because a heart that is injured may have a coronary thrombosis and a heart that has a thrombosis may be injured. If it is a young person and the injury occurred at one time the scars should be of the same age. Coronary thrombosis may be present but you can find plenty of old coronary infarctions where you cannot find thrombosis, the pathological characteristics of scars of myocardial contusions and infarcts are frequently identical and the presumptive nature of the origin of the disease must be determined by historical data rather than by postmortem examination.

I do recognize that this is a controversial thing but we ought to be informed and look for it and not say all of these things are purely coincidental.

PROGRESS IN WHOOPING COUGH

ROBERT L. WILDER, M.D.

Each year in the United States there have been about 6,000 deaths in infants and children under 5 years of age due to whooping cough!

More children die of whooping cough every year than die from measles and scarlet fever combined.

Tuberculosis is the cause of less than half as many deaths in children as whooping cough.

The death rate for whooping cough in Minnesota in 1940 was 32 per 100,000 of population. In 1920 it was 297 per 100,000 of population—nearly ten times greater than in 1940.

The improvement in mortality in Minnesota suggests that progress has been made in the control of whooping cough.

The threat of this disease to infants is shown in the age distribution of whooping cough deaths in Minnesota. For the past 10 years from 1931 through 1940 —

91 per cent of deaths were in infants less than 3 years old,
69 per cent of deaths were in infants less than 1 year old.

The challenge of whooping cough has not been disregarded. The purpose of this discussion is to emphasize a few of the significant advances of recent years.

PROGRESS IN BACTERIOLOGY

In 1900 Bordet and Gengou isolated a non-motile gram negative bacillus from the respiratory tracts of cases of whooping cough which they claimed was the specific cause of the disease. Today this organism is accepted by most authorities as the only causative agent. McCordock and Rich in 1932 claimed that a virus association was indicated by the presence of inclusion bodies in the lung tissue of fatal cases of whooping cough pneumonia. It has been possible to show that typical whooping cough can be produced by virus free suspensions of Pertussis bacilli. Frawley as recently as January 1940 has shown that filtrates of nasal washings containing Pertussis bacilli (which should certainly contain virus if virus plays any causative part) when introduced into the respiratory tract of susceptible children did not produce whooping cough.

Following discovery of the whooping cough bacillus and development of a culture media satisfactory for propagation of the organism there have been several important advances in Pertussis Bacteriology. These include:

1. Demonstration of a soluble endo-toxin by Bordet and Gengou in 1910.
2. Demonstration of the presence of agglutinins in the blood of patients recovered or convalescent from whooping cough.
3. Demonstration of the development of 4 plus complement fixation reactions in recovered cases.
4. Discovery of soluble exo-toxin.
5. Demonstration of positive skin reactions in recovered cases from the use of suspensions of bacilli, toxin, or endo-toxin.
6. Demonstration by Leslie and Gardner in 1931 of four cultural phases and the superior antigenic properties of phase 1 or smooth hemophilis pertussis bacilli.
7. Development of the opsono-cytophagic reaction by which the opsonin content of blood is measured in terms of the numerated cytophagic ability of the p.m.ns.

From the fundamental work in Bacteriology have come advance and progress in the clinical problems of Diagnosis, Prevention, and Treatment.

PROGRESS IN DIAGNOSIS

Of all the tests and reactions developed in laboratory studies the nearest approach to a practical diagnostic aid has been the cough plate culture test. In Denmark this test has been used routinely by the Department of Health for diagnosis of early or suspected cases of whooping cough. The test has also been used considerably in the United States. A Petri dish or small aluminum culture box containing sterile media of potato, glycerine, salt, agar and defibrinated blood is used. After a drink of cold water the patient holds the open dish vertically about 3 inches away from the mouth at the time of coughing. Coughing may be induced by pressure on the trachea just above the sternal notch. Exposed in duplicate and labelled, the plates are incubated in an inverted position. Plates must be examined daily. Moulds and spreaders are destroyed with a hot wire. The plates are examined on the third day with a hand lens. Small round mercury droplet like colonies are visible if pertussis bacilli are present. Positive culture plates are diagnostic, negative plates do not rule out the disease. Advantages of the cough plate culture are that frequently, causative organisms can be detected in suspected cases many days before blood lymphocyte changes occur, or several weeks before the onset of the whooping stage. Technical difficulties, however, make the test almost impractical for office use.

PROGRESS IN IMMUNIZATION

The use of vaccines to produce active immunization of susceptible children against whooping cough soon followed the isolation of the causative organism. Huenekens in Minneapolis in 1917, first reported development of positive complement fixation reactions in vaccinated children. A variety of immunizing

agents came into use. These included mixed vaccines, Krueger's, undenatured bacterial antigen or U.B.A., Mishulow's toxin vaccine of the New York City Department of Health Laboratories, Pertussis antigen detoxified or formalized filtrate, alum precipitate vaccine and specific soluble antigen for nasal instillation. Early reports of the use of these substances were encouraging but variable. In 1931 Leslie and Gardner showed the superior antigenic properties of Phase I or smooth H Pertussis bacilli. Madsen's work in the Faroe Islands—Sauer's work in this country, together with many other studies and reports have established the following points in relation to active immunization against whooping cough.

1. The best antigen used has been vaccine made from killed, unwashed Phase I, H Pertussis bacilli in strength from 10,000 million to 20,000 million bacilli per cc. Sauer's and Mishulow's vaccines are of this type.
2. The dosage with best results has been from 80 to 100,000 million bacilli divided and given subcutaneously or intramuscularly in three doses.
3. The interval between doses may be from one to three weeks.
4. No severe or fatal reactions have occurred.
5. An interval of three to four months is required to build up active immunity.
6. Evidence of the antigenic activity of this type of vaccine has been shown consistently and repeatedly by:
 - a. Production of typical skin reactions to subsequent intradermal injection of bacillary protein, toxin or endotoxin.
 - b. Increase in the agglutination titre of the vaccinated person's serum.
 - c. Production of 4 plus complement fixation reactions after vaccinations.
 - d. Increase of the opsono-cytophagic reaction in the blood of vaccinated children.
 - e. Decrease in communicability rate and incidence of whooping cough in controlled series of cases of vaccinated and unvaccinated children.
 - f. Decrease in the morbidity and mortality rates in communities where vaccination has been widely used in comparison to communities where whooping cough vaccination has been used very little.
 - g. Widespread evidence of modification of the severity of whooping cough in cases not having complete protection.
7. The exact proportion of complete immunity in any series of vaccinated cases cannot be accurately determined.
8. The duration of active immunity is at least two years and may be much longer.

PROGRESS IN PROPHYLAXIS OR PASSIVE IMMUNIZATION

All of the agents used in attempts to produce active immunization have been tried to prevent or modify whooping cough after exposure or during the catarrhal stage. In addition adult blood and serum, convalescent blood and serum and hyper-immune serum have been used. Comparative reports on the value of all these substances favor:

Hyper immune serum as most effective. Convalescent serum or blood next and adult blood or serum from suitable donors with a history of whooping cough ranking third.

Vaccines and filtrates are distinctly less valuable for prophylaxis because of the slower antibody response.

Hyper immune serum for use in whooping cough was prepared by Jundell in 1933. The essential technic is the repeated vaccination of Wassermann negative young adults who have recovered from whooping cough. Phase I H Pertussis vaccine is given at successive intervals. After a period of one to four months after vaccination the donors are bled and serum obtained. For storage purposes the serum may be concentrated by the lyophile process.

In July 1936 Kendrick reported the use of hyper-immune serum for passive immunization of exposed children. She found the use of this material increased the agglutination titre of the blood of recipients promptly. The opsonin content of the blood of the recipient was also increased as shown by consistent rise in the opsono-cytophagic index. Kendrick and later McGuinness, Bradford and others, have reported effective prevention of whooping cough in significant percentages of exposed susceptible infants and children.

To be most effective prophylactic or passive immunity should be established in the incubation or early catarrhal stages.

Ten to forty cubic centimeters of the immunizing material, depending upon the age of the child and the material used, may be given intramuscularly or intravenously as a single dose.

Passive immunity is short in duration and may last only 10 to 14 days. Repeated doses, therefore, may be required to maintain a protective level if prolonged exposure is present.

No untoward reactions have been reported from the use of suitably prepared and administered blood or serum.

Indications for prophylactic treatment are:

1. Exposed infants under 6 months of age.
2. Exposed unvaccinated infants under 2 years of age with beginning symptoms.
3. Exposed vaccinated infants under 2 years with early symptoms where less than four months have elapsed since whooping cough vaccination.
4. Exposed unvaccinated children over 2 years with a complicating abnormality such as congenital heart or complicating acute illness such as measles.

PROGRESS IN TREATMENT

Large doses, 300 to 500 mgm., of vitamin C daily have been advocated in the treatment of whooping cough but this treatment has not found wide support.

High altitude flights have also been reported in Europe as new and beneficial treatment of whooping cough. The chief value is probably the fresh air thus obtained.

The use of most antigenic materials in treatment has not been supported by the reports of careful studies. By the time the spasmodic stage is reached the individual has developed his own antibodies and has an abundant supply of antigen present in the body.

Logically hyper-immune serum, convalescent serum or blood of adults having had whooping cough should be useful to supply extra antibodies where the patient's ability to form his own immune substances is inadequate as in the infant under 6 months of age.

At this time there has not been sufficient use of this type of material to warrant a decisive opinion as to its value in treatment in the late catarrhal or spasmodic stages.

I want to cite one instance, however, where hyper immune serum in treatment seemed helpful. A male infant, age 6 weeks, was one of twins born at home. An older brother, age 3 years, had whooping cough at the time the twins were born. One twin became ill with a cough about two weeks after exposure and died. About three days after the death of the first twin the second baby began to cough. After one week of symptoms he was brought to the General Hospital. At home both infants had been given pertussis vaccine. On admission at age 6 weeks the second twin was given 20 cc. H. I. S., then a total of 70 cc. of hyper immune serum in 20 and 10 cc. doses intramuscularly at two- to seven-day intervals. Eight days after admission the baby was having 15 to 20 paroxysms of coughing per day. Eighteen days after admission the last dose of hyper immune serum was given. The baby improved as attested by decreasing paroxysms of coughing; there were no complications and on the 36th day after admission the baby went home fully recovered. The only additional treatment given was codein and chloral for sedation.

While it is recognized that for normal older children dependence for treatment can be placed upon simple sedation and the innate ability of the child to produce his own agglutinins and opsonins it is hoped that the work now in progress in

various centers in this country will show that the use of the newer agents of treatment will decrease the death toll of whooping cough in infants.

DISCUSSION

Dr. E. S. PLATOU: I want to congratulate Dr. Wilder on his competent review. Sometimes we complacently think of whooping cough as a disturbing disease of children but when we listen to the statistics I think we are impressed with the importance of the disease. Great progress has been made in its prophylaxis and treatment. As far as the final result is concerned, I wonder whether this therapy will stand the Blitzkrieg of epidemic. I am sure that Dr. Wilder agrees that this is the real test of the treatment under consideration. The therapy, prophylactic and active, though not claimed to be as effective as specific measures in some other infectious diseases, is extremely worth while.

The figures that Dr. Wilder quoted in comparison between 1920 and 1940, I think we have to take with a great deal of skepticism. I am sure he shares this because of the fact that in 1920 we were seeing a great deal of severe whooping cough in the hospital whereas in the past five years we have seen relatively little and relatively mild whooping cough.

In regard to diagnosis, the cough plate is very helpful but difficult to keep prepared and ready for use. He neglected to mention the white blood count and differential which I am sure he feels are very valuable in early diagnosis.

Of the prophylactic measures employed to date, I think that Sauer's antigen has stood the test of time better than any and whether the technical details of preparation or the large total dosage explain the better results has, I believe, not been determined.

The most critical study made in regard to protection was the one done in Cleveland which was presented before the Academy of Pediatrics in New York in 1937. Public Health men and pediatricians coöperating, took a series of families of treated and 200 controls in both of which groups they had school children and an infant in the family. The infants in alternate families were immunized. Their conclusions were that the incidence of the disease in the immunized was no less than in the non-immunized. Whereas they could not say that the vaccine in any way prevented whooping cough they admitted that there was a very striking difference in the disease in the infants who had been immunized and the infants who had not been immunized. Interesting to me is the fact that progress in this disease, particularly as we measure the progress immunologically, is contrary to everything that immunologists have predicted. Zinsser gave us very good reasons why tissue immunity alone was operative and yet from the work that Dr. Wilder has presented here it is rather certainly suggested that humoral anti-bodies are definitely effective in the disease.

Following the work of Bradford and others who originally prepared therapeutic serum, we prepared some in our laboratory. Experimentally it is capable of mouse protection against pertussis pneumonia. Results in the young infant are very dramatic.

THE STUDY OF PERITONEAL EXUDATES

U. SCHUYLER ANDERSON, M.D.

(Inaugural Paper)

The study of the physical characteristics, bacteriology and cytology of peritoneal exudates or fluids is now almost mandatory in the treatment of acute peritonitis. Surgery alone is no longer the treatment of choice in certain acute abdominal conditions. The intelligent employment of chemotherapy and specific serums requires a knowledge of the bacteriology of the exudate of peritonitis. Especially is this true in the treatment of primary peritonitis, the mortality of which, according to numerous recent reports in the literature, has been lowered by the use of these agents. Furthermore, cognizance of the fact that the characteristics of the exudate differ depending on the kind of irritant producing the peritonitis will aid in diagnosis. According to Steinberg,⁸ observation of the changing relation-

ship of leucocytes and bacteria during the course of acute peritonitis is of considerable prognostic value.

The presence of an irritant or an injurious agent, usually bacterial, in the peritoneal cavity is the cause of peritonitis. Non-bacterial irritants, such as bile, fluid from a ruptured ovarian cyst, blood, urine, and pancreatic secretions, with the exception of the latter, produce relatively less severe reactions than bacteria. Such non-bacterial peritonitis, however, seldom remains aseptic as secondary bacterial invasion occurs readily. The most common bacterial irritant is *Bacillus coli*. This organism was found in 87 per cent of 106 cases of peritonitis studied by Meleny, Harvey and Jern.⁵ Streptococci, staphylococci, pneumococci, gonococci, *Bacillus pyocaneus*, *Bacillus tuberculosis*, *Bacillus typhosis*, and anaerobic bacteria are found in the peritoneal exudate, their relative frequency being about the order named.

The formation of an exudate which is one of the fundamental phenomena of inflammation is produced by the passage of leucocytes and plasma from the blood stream into the peritoneal cavity. Coagulation of the serum results in a fibrin network, the amount of fibrin formed varying with different irritants. Gonococci produce a serous exudate with much fibrin which gives rise to dense adhesions, in contrast to streptococci which effect a thin and watery exudate containing little fibrin. The exudate in addition to fibrin, serum and leucocytes will also contain the irritant causing the inflammation. When the irritant is non-bacterial, such as bile or cystic fluid, the quantity of fluid in the peritoneal cavity will in many instances consist largely of the irritant and have relatively less of the actual inflammatory exudate.

The gross characteristics of the peritoneal exudate often indicate the kind of injurious agent creating the inflammatory reaction. *Bacillus coli* forms a brownish purulent fibrinous exudate with a foul, fecal odor. Pneumococci produce a slimy thick green odorless purulent exudate. *Bacillus tuberculosis* causes a thin lemon yellow or greenish fluid usually containing little or no fibrin but sometimes containing red blood cells. The exudate of an acute hemorrhagic pancreatitis has the color of beef juice and an oily appearance. The fluid from a perforated peptic ulcer in the absence of food particles is a yellow watery liquid with a sour odor. The exudate with a uriferous odor needs no explanation. Possessed with a knowledge of these reactions the surgeon frequently can make the diagnosis of an intra-abdominal condition as soon as the peritoneum is incised.

In some instances the gross characteristics are not sufficiently distinctive to indicate the diagnosis. In these cases the aid of the pathologist or bacteriologist is required. Lufkin⁴ has stated that the pathologist should be called as frequently to the operating room to aid the surgeon in making the diagnosis of an exudate, particularly peritoneal, as he is to assist in the diagnosis of tumors. The following case illustrates how the prompt recognition of the peritoneal exudate could perhaps have prevented a lethal outcome.

A white girl, 18 years of age, was admitted to the Minneapolis General Hospital on August 11, 1935. Her principal complaints, which were of one day's duration, were pain in the right lower quadrant of the abdomen, nausea, and vomiting. For a year there had been a vaginal discharge and attacks of right lower abdominal pain of short duration. Tenderness and rigidity were present in both lower quadrants, most pronounced on the right side. The external genitalia appeared inflamed and there was a profuse thin greenish discharge from the introitus. Considerable tenderness was caused on movement of the cervix. Both adnexal regions were tender and a sensation of fullness was elicited but no definite masses were palpable. No gonococci were demonstrable in urethral and vaginal smears. Her temperature was 100 and her pulse 92. The leucocyte count was 21,000 with 92 per cent polymorphonuclear cells.

It was the opinion of the gynecological consultant that although a diagnosis of salpingitis could be made, the diagnosis of appendicitis could not be excluded.

At operation a considerable amount of lemon yellow or greenish fluid containing a slight amount of fibrin was found in the abdomen. Cultures and smears were made of this but no immediate report on the smear was requested. Later reports, after operation, were that only a few pus cells and no bacteria were found on the smear and that the cultures were negative. The tip of the appendix was buried retroceally and covered with a slight amount of fibrin. The omentum was in the region of the cecum. The appendix was removed but, after removing the fibrin, the organ appeared to be normal. The Fallopian tubes were then inspected and were found to be red and edematous. No pus, however, could be expressed from the fimbriated ends. It was concluded that the patient was suffering from bilateral acute salpingitis and secondary peritonitis. The abdomen was closed with drains. The following morning the patient was in a state of shock. By the use of intravenous fluids this condition was alleviated but the abdominal pain and rigidity increased in severity. There was a recurrent attack of shock on the evening of the same day and the patient died early in the morning of the second postoperative day.

At autopsy, two ulcers of the duodenum were found, one on the antero-lateral surface at the level of the pyloric sphincter, and the other directly opposite on the medial posterior wall of the duodenum at the same level. There was a widely patent perforation nearly 1 cm. in diameter in the anterior ulcer. There was secondary serosal inflammation of all the abdominal viscera including the Fallopian tubes.

The exudate present in this case was not characteristic of salpingitis but was more representative of that produced by a peptic ulcer. The odor of the peritoneal fluid should have been noted because the musty sour odor of the liquid which leaks through the perforated peptic ulcer may have been appreciated. The immediate examination of the smear and the report that no bacteria and only a few leucocytes were present would have indicated in some measure, at least, that the irritant was chemical and not bacterial. It is true that bacteria are found in the peritoneal fluid after perforation of a peptic ulcer, but this is more common in perforations of longer duration, after recent ingestion of food, and in patients who have suppurative oral or upper respiratory infections.

Steinberg⁹ stated that a complete examination of the peritoneal fluid should consist of careful observation of the kind and number of cells, the number and species of bacteria, the presence of phagocytic leucocytes, and extraneous substances such as food particles, oil globules, and blood. Meleny⁶ has stressed the comparison of the smears with the subsequent culture as a basis for prognosis. If fewer species are found on culture than are seen in the smear, he considered the prognosis good. If all the species grow, indicating that they are viable, and none have been destroyed by the defensive forces of the body, the prognosis must be guarded.

While the examination of the peritoneal fluid obtained at operation has great utility, the preoperative study of the peritoneal exudate procured by intra-abdominal puncture or paracentesis is of inestimable value. Surgery is contra-indicated in certain intra-abdominal conditions. Cole¹ believed that immediate operation is not beneficial in the treatment of acute primary pneumococcal or streptococcal peritonitis. This seems to be the consensus of most surgeons. Neuhof and Cohen⁷ stated that the choice for or against operation is in doubt in 5 to 15 per cent of the cases and that any safe method of diagnosis of acute intraperitoneal disease is welcome. Denzer² concluded that the reduction of mortality in streptococcal and pneumococcal peritonitis depends upon early nonoperative diagnosis, for which abdominal tap is indispensable. Steinberg⁸ not only examined the peritoneal fluid obtained by intra-abdominal puncture preoperatively, but also frequently examined the exudate postoperatively, obtaining the fluid by the same method, in order to follow the course of the peritonitis.

In contrast to these opinions, Ladd, Botsford, and Curnen³ considered that the method of choice for recovering organisms in primary peritonitis is operative. They recommended making a one inch muscle splitting incision in the right lower quadrant under local or cyclopropane anesthesia. They did not advise abdominal paracentesis because, if the results are negative, pri-

märy peritonitis has not been ruled out, and the needle may enter a loop of bowel, which may do no harm but is undesirable.

Cole¹ stated that although there is dispute about the safety of diagnostic intra-abdominal puncture, definite and proved instances of damage produced by this method are lacking. Neuhof and Cohen⁷ used the method without any injurious effects in more than 100 cases. Touroff¹⁰ who has used intraperitoneal puncture for fifteen years without mishap, believed that consideration of the safety of the method was no longer necessary. Intra-abdominal puncture has been used in nearly 100 cases at the Minneapolis General Hospital* without injury in a single instance.

Contra-indications to the employment of diagnostic abdominal tap are chronic or subacute disease of the peritoneal cavity and the history of previous operations, since there is a possibility of adhesions with fixation of the intestines to the abdominal wall. The method should not be used in those cases in which the diagnosis is clear without it. The needle should not be inserted in the region of a mass.

The technic of the procedure is quite simple. An 18 gauge spinal puncture needle is the preferred instrument. Danzer² first recommended the use of a glass capillary tube but later abandoned this apparatus for the spinal puncture needle. Steinberg⁸ devised a special capillary steel pipette. The skin in the region of the umbilicus is prepared with an antiseptic solution, and a site about one inch below the umbilicus is infiltrated with novocaine. The level of the needle, with the stylet in place, is placed downward. The needle is then inserted obliquely through the skin with steady pressure until a sudden release indicates passage through the posterior sheath of the abdominal muscles. A 5 cc. syringe is attached and gentle suction is applied. As there is a tendency for small quantities of fluid to form a film along the parietal peritoneum, it is important to depress the syringe, thus placing the point of the needle close to the peritoneal surface. Since only a drop of fluid may be diagnostic, the needle should be pointed in different directions in an attempt to obtain the exudate. In many cases of intraperitoneal disease, no fluid is obtained, but it is asserted by those who use the method that as they become more expert in making the aspiration, the percentage of negative taps becomes lower.

When a positive tap is obtained, the fluid is examined grossly, spread on a slide, stained and cultured. The smears should be prepared with Wright's and Gram's stains. Steinberg⁸ advocated counting the free bacteria in ten oil immersion fields and calculating the average in one field. It was his opinion that less than six bacteria to the field indicated less severe peritonitis, but that more than ten bacteria to the field indicated a more severe and advanced peritonitis. He reported 22 patients with peritonitis in which six bacteria to the field were found, and 21 patients in which more than ten bacteria to the field were present in the exudate. All of the former survived while 19 of the latter died.

The morphologic appearance of the bacteria is observed, differentiating the gram-negative from the gram-positive organisms. In appendicitis, *Bacillus coli* alone or in combination with streptococci may be demonstrated. The finding of large numbers of gram-positive cocci in chains practically excludes appendicitis and fixes the diagnosis as either pneumococcal or streptococcal peritonitis, probably the latter. Pneumococci may occasionally appear in short chains, but frequently the diplococci with demonstrable capsules are observed. In acute gonococcal peritonitis the gram-negative kidney-shaped diplococci can be found within polymorphonuclears and sometimes free in the exudate.

In the diagnosis of streptococcal and pneumococcal peritonitis in children, abdominal puncture is extremely useful. The decision to employ conservative therapy or to resort to surgery will often depend on the results of the puncture. The following case exemplifies the value of the procedure.

A white girl, 6 years of age, was admitted to the Minneapolis General Hospital on December 12, 1935. Her symp-

*These intra-abdominal punctures have been performed by the resident surgical staff at the direction of Dr. A. A. Zierold, chief of the department of surgery of the Minneapolis General Hospital.

toms were severe diarrhea and abdominal pain of two days' duration. A head cold with coughing began nine days before admission. Essential findings were extreme tenderness and considerable rebound tenderness of the abdomen, and a questionable tender mass palpable on rectal examination. No abnormalities of the lungs were found on physical or roentgen examination. A provisional diagnosis of diffuse peritonitis secondary to a ruptured inflamed appendix was made. However, by intraperitoneal puncture, a greenish creamy pus was obtained. Smears of this pus were found to contain lancet-shaped diplococci resembling pneumococci which were type I. Evidence of pneumonitis was found later. Chemotherapy was not used at this time but specific serum was administered. The peritoneal cavity later was drained, partially at least, by the insertion of a mushroom catheter through a trocar, much in the same manner that the pleural cavity is drained. Although the patient died three weeks after admission, operation was avoided and early diagnosis was made by using intra-abdominal puncture to obtain the exudate.

In the following case, operation may have been withheld if intraperitoneal puncture had been used. A white girl, 4 years of age, was admitted to the Minneapolis General Hospital on March 8, 1937. Symptoms were abdominal pain, fever, chills, vomiting and general malaise. The patient was semi-delirious. Rigidity and tenderness were present in the right lower quadrant of the abdomen. At operation the appendix which was removed was found to be normal. A thin turbid fluid filled the peritoneal cavity. Pneumococci or streptococci were demonstrated in the smear of this fluid. Types I and II pneumococcus serum were given but the patient died two days after admission. The culture of the exudate obtained at autopsy grew hemolytic streptococci.

In the last illustrative case,* abdominal paracentesis was of definite service. A white girl, 9 years of age, was admitted to the Minneapolis General Hospital on April 1, 1941. Her complaints which were of twenty-four to forty-eight hours' duration, were nausea, vomiting, anorexia, abdominal pain, and diarrhea. A head cold had developed four days prior to admission. Her temperature was 103.4, and her pulse was 130. Extreme tenderness and rigidity of the entire abdomen were present. No abnormalities were found on examination of the chest. The leucocyte count was 21,700 with 95 per cent polymorphonuclear cells. Two drops of cloudy fluid were obtained by abdominal tap. Examination of smears of this fluid showed organisms resembling pneumococci. Sulphathiazole was given immediately. Type I organisms were recovered in material obtained by gastric lavage. Anti-pneumococcus serum was administered. The temperature became normal and the abdominal findings disappeared in 36 hours. Improvement has been remarkable and recovery which seems certain in this case, will in a large measure, be due to early diagnosis.

Intraperitoneal diagnostic puncture may be used with great advantage in the recognition of other acute intra-abdominal disease such as acute hemorrhagic pancreatitis, traumatic perforated viscus, and ruptured ectopic pregnancy. However, Neuhof and Cohen⁷ issued the warning that if the decision has been reached that operation is indicated, operation should be performed, regardless of a negative or inconclusive puncture.

SUMMARY

1. An attempt has been made to stress the importance of careful examination of the exudate or fluid of acute peritonitis.
2. The value, safety, and contra-indications of intraperitoneal diagnostic puncture have been discussed.
3. Four illustrative cases of acute peritonitis have been presented.

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*This case is cited by the courtesy of Dr. A. V. Stoesser, chief of the department of pediatrics of the Minneapolis General Hospital.

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DISCUSSION

Dr. S. R. MAXEINER: I am very much interested in Dr. Anderson's paper and I would like to congratulate him on a very nice presentation. A number of things came to my mind while listening to him, one of which was the missing of a gastric ulcer. When we are suspicious that a perforation exists in a hollow viscus we open the peritoneum under water. The incision is carried down through the skin and fat to the peritoneum and is then filled with water. If the patient has a pneumoperitoneum, bubbles of gas escape through the water when the peritoneum is punctured, the same as one sees when a tire tube is tested for a leak. Another thing which we have frequently done has been to give methylene blue by mouth. It is interesting how quickly methylene blue will find its way through the leak and a blue stream running down through the peritoneum will lead directly to the perforation in the stomach or duodenum.

I was interested in the report on the case in which there was confusion between diagnosis of tubes and appendix. In cases of ruptured appendices Professor Wangenstein at the University is encouraging the non-operative intervention technic. We have followed that technic as advocated by Ochsner in many cases, even dating back to my association with Dr. Farr. In these cases, however, in which it is suspected that the appendix may not be perforated, it is difficult to determine whether the pathology is in the appendix or in the Fallopian tube. Inflammation of a pelvic lying appendix is sometimes almost impossible to differentiate from a pelvic inflammation. A recent autopsy revealed a so-called pelvic peritonitis to be due to a ruptured pelvic lying appendix and we believe that one of the most common errors in the diagnosis of appendicitis is in those instances where the appendix lies below the brim of the pelvis. Only recently we had such a patient whose history was almost typical of appendicitis. Smears from the patient's cervix were positive for the gonococcus but her symptomatology was all related to the right side of the abdomen. At operation we found a very hot appendix which, however, subsequently showed all the inflammation to be serosal. Exuding from the tip of the right tube was a yellowish purulent exudate which, under the microscope, revealed numerous gonococci. Sulfathiazole was sprinkled into the pelvis, around the ends of both tubes and in the cul-de-sac. The abdomen was closed without drainage and the patient made a very uneventful convalescence.

I was also interested in Dr. Anderson's statement with reference to the intra-abdominal tap. Dr. Farr, in his work on local anesthesia, repeatedly demonstrated in clinics that a needle pushed through the abdominal wall in the absence of adhesions simply pushed the bowel aside and did not cause a perforation. In those days we did a large number of pneumoperitoneal injections for diagnostic purposes. Most of these injections were made to clear up an obscure diagnosis and often in patients who had previously been operated upon or who had adhesions, the needle was usually introduced well on the side of the abdomen away from the previous operative scar. In no instance were there any complications or any suggestion that the bowel may have been punctured. In many instances, a dry tap may be converted into a productive one if the position of the patient is so changed that fluid is allowed to gravitate toward a needle in a dependent portion of the abdomen.

I am personally extremely apprehensive about the use of mushroom catheters, having had the head of one pull off in

the thoracic cavity. Subsequent thoracotomy was necessary for its removal.

Recently, I watched Dr. Ruddock of Los Angeles who has greatly popularized the use of the peritoneoscope. His demonstration was beautiful and we were able to see implants on the peritoneum, the gall-bladder and the stomach which was transilluminated by the swallowing of a light on the end of a tube, visualizing by its illumination neoplasms of the stomach. I think there is unquestionably a field for diagnosis by the peritoneoscope but to date there has been a very definite mortality in its use.

Dr. MAYNARD NELSON (by invitation): Dr. Anderson has covered this field very well but it might be interesting for me to relate our experience with peritoneal puncture at the General Hospital. Our interest in the matter was instigated by Dr. Zierold, and the work of Dr. Steinberg of Toledo.

We have now done about 100 punctures in cases of appendicitis and feel that it is of some value in our treatment and also helpful in prognosis. In a differential diagnosis I might say we have been able to differentiate two cases of pancreatitis, two cases of ruptured ectopic pregnancy, two cases of pneumococcus peritonitis, one case of ruptured gallbladder and one case of gonococcus peritonitis. No explanation is necessary as to how that is done. In differentiating the pancreatitis from perforated peptic ulcer, we simply test the fluid obtained and you get the cherry red reaction from the acid secretion and with the pancreatitis we noticed fat droplets in the fluid. In the case of gonococcus peritonitis I feel it was of definite value in that it saved the patient from surgery.

Dr. ERLING S. PLATOU: I think Dr. Anderson should be congratulated. His subject is perhaps more timely in the light of chemotherapy and new serum therapy. I had the privilege of working under Dr. Denzer when he first brought out his needle and later used the spinal puncture needle. At that time the question whether primary peritonitis in an infant should be operated or not was more unsettled. I think it is even more appropriate now to study exudates than it was then because of the advent of chemotherapy and specific serum.

I would like to ask what has happened to peritoneoscopy that was so talked about five years ago. Has that fallen into disuse?

Dr. THOS. J. KINSELLA: I believe that peritoneoscopy is one procedure which we neglect in diagnosis. Pneumoperitoneum of itself offers certain information and when followed by peritoneoscopy offers much more. Through the peritoneoscope the operator can visualize the surface of the peritoneum, the liver, gall-bladder, spleen, the pelvic and other organs, at times even the appendix. Metastatic tumors of the liver or peritoneum may at times be demonstrated thereby obviating the necessity for major exploratory procedure.

Pneumoperitoneum and peritoneoscopy should not be used in the presence of acute inflammatory disease as they may bring about dissemination of the infection. In other conditions it is a diagnostic procedure whose possibilities are usually overlooked.

Dr. U. S. ANDERSON: I wish to thank Dr. Nelson and the members for their discussion. The patient with the perforated peptic ulcer was one which I operated upon during my last six months as resident fellow in surgery at the General Hospital.

The history of the vaginal discharge, lower right quadrant pain and physical findings were all against peptic ulcer. The findings at operation were also somewhat confusing, but if the type of exudate had been appreciated, I believe the diagnosis could have been made.

We have used Dr. Maxeiner's method of using methylene blue but have not incised the peritoneum under water. I think both of these methods are useful.

I believe that intra-abdominal puncture has a definite place in diagnosis but I wish to stress particularly the study of the peritoneal exudate itself from the standpoint of its gross appearance, bacteriology and cytology.

ERNEST R. ANDERSON, M.D., *Secretary.*

News Items

Dr. Roscoe R. Graham, president of the Inter-State Postgraduate Medical association, will make a fifteen-minute informal address "probably touching on the war and Canadian-American relations," when the group convenes in Minneapolis October 13th to 17th. The 26th annual International Medical Assembly will also feature among its speakers: Dr. Frank H. Lahey, president of the American Medical association; Dr. Evarts A. Graham, president of the American College of Surgeons, who will speak on "Medical Responsibilities Placed Upon America by the War"; and Dr. George W. Crile, past-president of all three organizations. Dr. Charles E. Proshek, Minneapolis, chairman of the local arrangements committee, who will be among those at the speakers' table, will welcome the assembled guests and introduce Dr. Roscoe Graham.

Dr. George H. Mitchell, physician of Milnor, North Dakota, has left for the British Isles where he has accepted a Red Cross position from the British ministry of health.

Dr. Oral H. Stone has become associated with Dr. Malvey in Bottineau, North Dakota. Dr. Wm. Durnin, formerly with Dr. Malvey, has joined the medical corps of the U. S. Army.

Dr. D. M. Sayles, who has been camp physician at the CCC camp at Pritchard, Idaho, recently returned to Missoula, Montana.

Dr. Norman E. Rud has joined the staff of the Two Harbors hospital, Two Harbors, Minnesota.

Dr. O. J. Hagen of Moorhead, Minnesota, has been elected a fellow in the International College of Surgeons.

Dr. J. L. Adams, pioneer physician of Morgan, Minnesota, who now resides in California, was honored by the Morgan community recently. At his annual visit to the community where he pioneered, a granite monument with a bronze plaque bearing his likeness was unveiled. Dr. Adams practiced in Morgan for more than thirty years. He retired about fifteen years ago and moved to California.

Dr. William Clarke has been appointed chief of clinical laboratories and pathology at Station hospital, Fort Leonard Wood, Missouri. Capt. Clarke formerly was on the staff of the University of Minnesota hospital, department of internal medicine.

Dr. Donald L. Peterson has resumed his medical practice in Fargo, North Dakota, after a tour of active duty at Hamilton Field, California, with the U. S. Army air corps.

Dr. Charles E. Lyght, director of the student health service at Carleton college, Northfield, Minnesota, addressed the Michigan State Medical association at their annual meeting at Grand Rapids, Michigan, on September 18. His subject was "Educational Aspects of Diagnosing Tuberculosis Early."

Dr. R. H. LaBree, formerly associated with the Rood hospitals at Chisholm and Hibbing, has joined the Duluth clinic, Duluth, Minnesota.

The Association of Military Surgeons of the United States will meet October 29th to November 1st at the Brown Hotel, Louisville, Kentucky. All members of the medical profession are invited to attend as guests and it is hoped that as many members of the Medical Defense Committees as possible will come.

Dr. Karl Lundeberg, Northfield, Minnesota, has been promoted to the rank of Major in the medical corps of the U. S. Army and continues on duty in the surgeon general's office in Washington, D. C.

The Alumni Association of the University of Minnesota Medical School will present its Annual Clinical program at the University Hospitals on Friday, October 31, 1941, which is the day before the Homecoming game between Minnesota and Northwestern universities. The 1921 class of the Medical school will celebrate its twentieth anniversary at this time. Several prominent members of this class will participate in the clinical program which is being arranged by Drs. Horace G. Scott, chairman, J. Richards Aurelius, Harold F. Buchstein, and L. Haynes Fowler.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth. The speaker is William A. O'Brien, M.D., Director of Postgraduate Medical Education, Medical School, University of Minnesota. The dates and titles are as follows: October 4—Feeding the Nation, October 11—Dieting, October 18—School Lunches, October 25—Nutrition and the Teeth.

Future Meetings

South Dakota Public Health Association
(Health Officers' Association)

TENTATIVE PROGRAM

Marvin Hughitt Hotel, Huron, South Dakota

October 27, 1941

8:30 A. M.—Registration.

10:00 A. M.—"Encephalitis"—1941—U. S. Public Health Service (speaker to be announced).

11:00 A. M.—Clinical Encephalitis (Speaker to be announced).

Noon intermission.

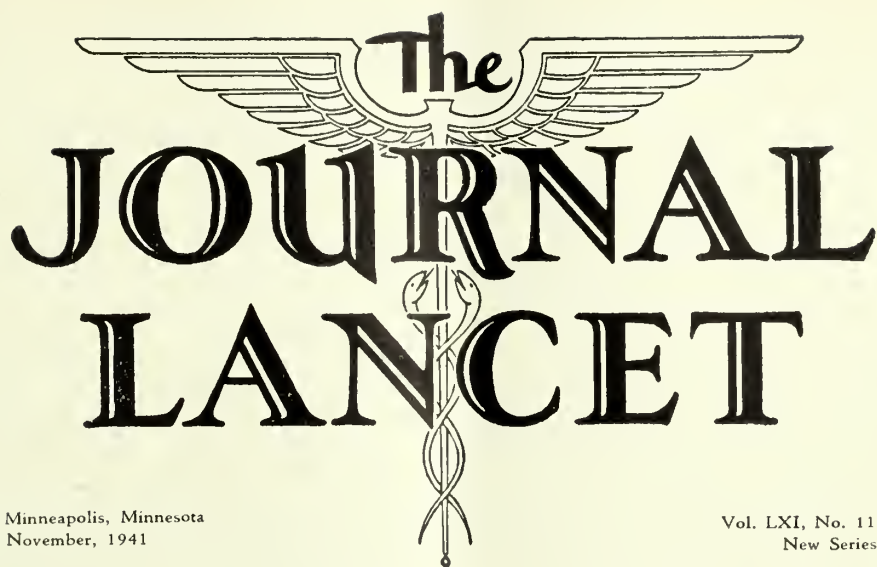
1:30 P. M.—County Immunization Program—H. R. Brown, M.D., President, Watertown, South Dakota.

2:00 P. M.—Small Pox, Diphtheria—State Board of Health.

3:00 P. M.—Election of officers. Reports.

J. F. D. COOK, M.D., Secretary,
Pierre, South Dakota.

H. R. BROWN, President,
Watertown, South Dakota.



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New Series

Selenium Poisoning in the Human

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Rapid City, South Dakota

SINCE the report by Lemley¹ on the first known human case of selenium poisoning from natural sources, many others have been studied. In the last year, we have found more than thirty individuals who have shown definite incapacitation from the effects of selenium poisoning. These individuals come from surrounding territory in North and South Dakota, Montana, Wyoming and Nebraska; they have been thoroughly studied and the various symptom complexes carefully recorded. Wherever possible, the source of the selenium intake has been investigated, and the results obtained by eliminating the source of intake have been gratifying in the treatment of these patients. Our work has been carried on in close coöperation with the members of the department of chemistry of the South Dakota College of Agriculture and Experiment Station at Brookings who have made all of our analyses. Without the knowledge obtained from their extensive animal studies and experiments, our work would have been almost impossible. We are herewith submitting reports on a few cases with the more common symptom complexes and the methods by which these cases are discovered. While these cases have been thoroughly studied, we shall omit in our reports a great mass of negative findings.

The first cases recorded are all of one family living on the same ranch in western South Dakota. A large portion of this ranch is in the Niobrara formation which is known to be highly seleniferous, the remainder of

the ranch being almost entirely selenized by washings from this stratum. This family has been under our observation for almost ten years and we have long been of the opinion that there was something wrong with the entire family, as besides having the usual illnesses and accidents that an ordinary ranch family has, they have been sickly, did not feel well, and were tired to an excessive degree and have not been able to perform satisfactorily their various tasks necessary to ranch life. We were always of the opinion that it was some underlying toxic element, or some dietary deficiency, although their diet has been regulated the last few years so that it is almost an ideal American diet. It has come to our attention in the last few years, that it is in the spring and early summer that this family has been noticing the most trouble. Our attention was drawn to selenium poisoning as a cause of their trouble when a batch of eggs from this ranch failed to hatch satisfactorily at a local hatchery and upon examination, the eggs were found to be heavily selenized. The diseased and deformed embryo chicks resulting from selenized eggs have long been known to poultry raisers and have been thoroughly studied by Moxon et al.^{2,3} It is interesting to note, in the study of this family, that the girl had attended high school in a nearby city, felt fine and was in good condition until she returned to the ranch when school was out in June and then in about two weeks, began to show typical effects of selenium poisoning which the other members of the family had shown since earlier spring.

†Lemley Clinic.

On close inquiry, livestock on the ranch had shown typical effects of selenium poisoning for many years. The grain which was stored on the ranch and which was fed to the milk cows and chickens, was found, on analyses, to be highly selenized. Garden vegetables, both fresh and canned from previous years, and some canned meat, were found to contain, on the average, high concentrations of selenium. Fresh eggs produced and used on the ranch were also found to be highly seleniferous. The method of intake of selenium thus was definitely determined and a study was made of the members of the family. They were instructed to bring in twenty-four hour samples of urine which were sent to the department of chemistry, Experiment Station, Brookings, South Dakota, for analysis. The urine of the boy, 8 years, F. M. Jr., contained 550 parts per billion of selenium. The father, F. M., 46 years, showed 200 parts per billion of selenium. The mother, 43 years, showed 250 parts per billion. An uncle, 42 years, showed 600 parts per billion. The daughter, 16 years, showed 300 parts per billion. By way of comparison, these urines show a higher concentration of selenium than many of the experimental animals that are acutely ill, very lame and almost unable to walk, and whose hoofs are sloughing off. It has been shown by Moxon, Schaeffer, Lardy, DuBois and Olson, that the rate of excretion of selenium can be increased in selenized animals by the administration of bromobenzene and confirmed by us in the human by the administration of bromobenzene in the first reported case and in many others. Bromobenzene was then administered to this family with the instructions to collect twenty-four hour samples of urine and submit them for analysis during the time of the administration of this drug. As was shown in our original case, the output increased rapidly and then tapered off toward zero. For example, with F. M. Jr., the excretion promptly rose on the first day to 1800 parts per billion, second day 700 parts per billion, third day 100 parts per billion, fourth day 80 parts per billion and the rest of the family exhibited similar increases in output.

The complaints exhibited by the entire family were very similar before the administration of bromobenzene and were as follows: slight, continual dizziness and clouding of the sensorium, extreme lassitude, not particularly marked in the early morning hours after arising but very marked in three or four hours afterwards and continuing throughout the day. There also was a feeling of depression accompanying the lassitude together with a moderate emotional instability. The patients tired on exertion and were not able to perform the ordinary ranch work especially toward the end of the day. They complained that their powers of concentration were markedly impaired and that they felt dull and depressed. Toward the end of the day, ordinary tasks which they usually enjoyed when they felt well, became matters of considerable effort and if they did not keep going about their work but rested or tried to read, they would soon become very drowsy and fall asleep.

After the elimination of labile selenium by the administration of bromobenzene, these people improved

markedly. The sensorium cleared; they were better able to concentrate and felt a considerable greater desire and ability to work. This improvement, after the administration of bromobenzene, is constantly noted in most of our other cases although the effect is but temporary, due to the fact that bromobenzene apparently eliminates selenium from only a few of the body tissues in which it is stored and that these proteins quickly absorb selenium from other depots in the body. The symptoms recur and the effect is shortened if the intake of selenium is not eliminated. This family was instructed to eliminate the source of intake before described, by not using the various products of the ranch which contained selenium and their general condition has therefore remained improved. We administer bromobenzene with great care and close observation and for only short periods of time never exceeding five days, giving 3 minims three times a day immediately after meals. As was before stated, these patients were studied as completely as possible; they had complete blood and urine analyses, complete physical examinations by a qualified internist, complete neurological examinations by a qualified neurologist, complete gastrointestinal series and gallbladder series. The basal metabolic rates were studied and careful and exacting histories were obtained.

As far as we know, the symptom complexes above described together with a knowledge that the suspects live in selenium territory and the findings of concentrations of selenium in the urine above 100 parts per billion and the increased elimination of selenium in the urine by the administration of bromobenzene and the elimination of selenium from the diet with resulting improvement of the symptoms, constitute the basis for the diagnosis for selenium poisoning. No other clinical examinations thus far known, even in those who have had long-standing and severe selenium poisoning, are at all significant or diagnostic. In view of our experience with humans and animals with selenium poisoning, it hardly seems possible that humans could show parallel concentration to animals which are severely sick and even dying, and not sustain material organic damage.

The next case to be reported is a continuation of our original case reported in the *JOURNAL-LANCET*, December, 1940. A rancher, who had been symptom-free since the preceding year due to elimination of selenium as far as possible from his diet and who had been under close observation, had a recurrence of his original condition which was an acute dermatitis involving the hairy surfaces of the forearms, the anterior surfaces of the thighs, and a peculiar brownish bronzed condition of the skin. There were many perifollicular pustules from which the hair could easily be pulled out and which usually had attached to it the remnant of the follicle together with a small amount of pus around it. The same procedure was used as in the original treatment, that is hospitalization, and the administration of bromobenzene with the same results, namely the quick disappearance of the lesions and the same rise in the rate of elimination of selenium. A careful analysis of the foods that he had been using demonstrated that some

canned meat contained 0.40 parts per billion of selenium which is a highly toxic amount. The animal from which the meat was obtained was a fat young heifer without any apparent symptoms of the disease. Since the removal of this source, he has had no further trouble.

The next case to be recorded is a farmer, living in western South Dakota who complained of a dry follicular rash over the hairy surfaces of the body except the scalp, more pronounced in the areas exposed to sunlight. This eruption had been present for several years, coming on in the early summer and lasting until early fall. The patient stated that along in the late summer, the lesions became gradually worse each year and would finally result in what he termed "boils". On August 22, 1939, these lesions exhibited the same appearance as those of our original case with the exception that some of the pustules, especially on the legs, were surrounded by rather extensively reddened and infiltrated areas with a large punched-out necrotic center. These lesions were exceedingly chronic and did not respond to any form of treatment. The patient claimed that with the development of his affliction, he became increasingly dizzy, was extremely tired and unable to work especially toward the end of the day, could not concentrate on his work, fell asleep easily if he did not "keep going". He stated that this condition was present every year about the same season for the last three years since moving the year before to his present location. He also stated that his wife felt exactly as he did, with the exception that she did not have the skin manifestations. Selenium poisoning was suspected and analyses made of the urines of the husband and wife with urinary concentrations of 235 and 124 parts per billion, respectively. The administration of bromobenzene increased the output of the husband as high as 730 parts per billion and produced a marked improvement of the symptoms; his skin cleared up for the first time in three years at that time of the year, which was in August. It has recurred each year since but with the occasional administration of bromobenzene, the symptoms have been alleviated markedly. A thorough study was made of the possibilities of the sources of his intake of selenium but this could not be definitely determined. It was thought that it was coming from the water supply which contained a low selenium content but due to the fact that the average hard-working farmer consumes a large amount of water, this was thought to be the source of a part of his intake, although no other source could be found.

Cutaneous lesions of selenium poisoning do not present, upon histological examination, any characteristics to differentiate it from a simple chronic inflammation characterized by perivascular accumulations of lymphocytes and there is nothing specific about its lesions.

The next case is that of a 65-year-old rancher from northwestern South Dakota who came in April 1, 1940, complaining of pain and soreness in the epigastrium, belching of a large amount of gas, a burning sensation in both lateral chest regions radiating down the flanks and along the lower costal margins. He complained of constipation which was relieved by rather large amounts

of mineral oil and that occasionally his constipation would be relieved and that he would have a diarrhea lasting several weeks at a time. With the diarrhea, he usually had to get up four or five times a night and had quite watery stools. There was no evidence of blood either occult or otherwise. He had no abdominal cramps and no other discomfort that might be attributed to the alternate diarrhea and constipation. He complained of weakness and dizziness and that he tired easily and for the last year and a half has not been able to work. These were the only positive complaints. He stated that he had been examined by several doctors in the last few years and was thoroughly examined and observed over three weeks' time at a large midwestern clinic and that nothing definite could be found. He had lived in the same locality where he is living now for the past 25 years and these symptoms had been present for about 20 years. He had known of considerable alkali disease or selenium poisoning among the stock in the vicinity where he lived. He was thoroughly examined in this clinic and observed as an ambulatory patient for one month and then was admitted to St. John's hospital in Rapid City for further observation. At first we were of the opinion that his diet had been insufficient in some of the vitamins and these were administered in large dosages without relief. We then suspected more strongly that the cause might be selenium poisoning and his urine was therefore examined. It contained large amounts of selenium and ran as high as 250 parts per billion but his regime on selenium-free foods did not materially affect his urinary output and repeated cholecystograms and repeated complete gastrointestinal studies had been made without any positive findings except a questionable delayed emptying time on the gallbladder.

An exploratory abdominal operation was performed. The positive findings included a small Meckel's diverticulum which was evidently symptomless, but which was removed. The stomach and intestines were entirely normal. The gallbladder was normal in appearance and careful inspection of the common duct revealed no particular pathology. Inasmuch as the cholecystograms had demonstrated the questionable emptying time of the gallbladder, the gallbladder was removed mainly for pathological examination. The liver showed what was felt to be a very early cirrhosis and a specimen was removed for biopsy. These organs were then carefully examined by Dr. E. T. Bell of the Department of Pathology, of the University of Minnesota, and his report showed a very early cirrhosis of the liver with a normal gallbladder. The patient recovered nicely from the operation but did not feel any better for a period of many months. He was kept on a strict selenium-free diet and then improved somewhat for the first time under the administration of bromobenzene. Since that time he has been gradually improving although he still eliminates considerable quantities of selenium in the urine and at the last examination, he was quite well and able to work again.

Cirrhosis of the liver is the usual result of selenium poisoning in the dog which has been thoroughly studied

by Moxon³, and it is very likely that there are many of these cirrhoses caused by selenium hitherto unrecognized in the population of our western states. In this case, the condition, after the withdrawal of the selenium and the elimination of that portion of it which is possible with the administration of bromobenzene, showed a steady improvement and would indicate that selenium is the cause of this cirrhosis. As to the final outcome of the cirrhosis, time alone can tell.

In conclusion, we would like to state that the purpose of this paper is to bring out some of the different symp-

tom complexes that we have found to be due to selenium poisoning and to suggest that physicians throughout the known selenium areas suspect some of their chronic cases that have defied diagnosis or treatment to be selenium poisoning.

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THE TREATMENT OF WAR BURNS*

Surgeon Rear Admiral Cecil P. G. Wakeley

The treatment of severe burns, summarized by Surgeon Rear Admiral Cecil P. G. Wakeley, Royal Naval Hospital, Hants, England, is a three-fold problem: first, the saving of life; second, the local treatment of the burned areas; and third, the preservation or restoration of the function of the parts involved.

Shock is combated by morphine, blood serum, adrenal cortical extract, oxygen and heat. Pain *must* be relieved, by use of doses of morphine. Plasma loss is compensated for by transfusions of whole blood, citrated plasma, or reconstituted serum. Fluid imbalance is corrected by intravenous injections of adrenal cortical extract. Anoxia is corrected by inhalations of oxygen.

The burned areas should be thoroughly cleansed immediately; if this is impossible, initial dressings of gentian violet jelly may have to serve. For burns of the face, cod-liver oil is good. Saline dressings, if they can be kept wet, are also effective.

When the victim can be transferred to a hospital the wound may be adequately cleaned and more permanent dressing begun. Under strictest aseptic precautions and sufficient anesthesia, all loose debris is removed, the area is washed in warm saline, dried and sprayed with triple-dye (2 per cent gentian violet, 1 per cent brilliant green, 0.1 per cent neutral acriflavine). When the first spraying has dried, a second is applied which is usually sufficient. The patient is then put to bed, without dress-

ings, under a heated cradle. Sulfanilamide by mouth may be used for three days.

Tannic acid is used for burns of the trunk. If infection develops under the tannic acid coagulum, the crust must be removed and the region sprayed with gentian violet; tannic acid is not re-applied.

For third degree burns in some areas, dressings of tulle gras—gauze saturated with petroleum jelly and balsam of peru—vitaminized and sterilized—may be expedient. These dressings may be used after sprinkling with sulfathiazole or sulfanilamide powder. Usually such dressings serve the purpose better if kept moist by superimposed wet saline packs.

Gentian violet jelly or cod-liver oil dressings are advised for burns of the face. In some cases triple-dye is effective, but tannic acid is contraindicated for use on the face.

As soon as new skin appears, it should be nourished and kept flexible by daily rubbing with lanolin, continued for at least three months.

The envelope-irrigation method of treating burns, devised by John Bunyan, is particularly suitable for burns of the extremities. It is painless, requires no dressings, promotes epithelialization, allows free movement of the part, and is especially adapted for those cases complicated by fractures. An electrolytic sodium hypochlorite solution is run through an oil silk envelope which encases the burned part.

For very extensive burns, total immersion in a warm saline bath for an hour is desirable as the preliminary step in treatment.

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Some Pathological Cysts with Special Reference to the Nasopharynx*

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THE dictionary states that the word cyst is Greek in origin, and means a bladder. It is an abnormal sac containing gas, fluid, or semi-solids. Cysts, according to Hektoen, are secondary formations that occur in different organs under similar conditions and consequently merit a general consideration; in a broad sense, a cyst is a pathological cavity provided with a distinct membrane enclosing a fluid or semi-fluid.

There are also cystomas. A cystoma is a true tumor, arising from active proliferation of a matrix destined to form cystic spaces; whereas, a cyst is a secondary formation not primarily due to tissue proliferation.

Cysts may be classified as: (1) Retention cysts, (2) Cysts from softening, (3) Tubule cysts, (4) Parasitic cysts, (5) Apoplectic cysts.

Retention Cysts are abnormal dilatations of glandular follicles and ducts, as well as other pre-existing cavities and canals due to the accumulation of the secretion of the structure in question. Retention cysts possess either an epithelial or an endothelial lining. The essential cause is the obstruction to the outflow due to a narrowing or closing of the gland ducts by scar, pressure torsion, impacted stone, foreign bodies, or secretion, and is followed by cystic dilatation, e. g. sebaceous glands. An altered or abundant secretion in a closed glandular follicle may lead to cystic dilatation from failure of absorption, e. g. the thyroid or hypophysis. The lining is epithelial because it is normal to the structure. Endothelial lining occurs in lymph vessels, bursae, etc.

Cysts from softening occur with more or less distinct walls but are neither epi- nor endo-thelial, but occur as a result of retrogressive changes accompanied by disintegration and softening as in degenerated cancers.

Tubule cysts are cystic dilatations of functionless ducts and tubules present in the body as remnants of embryonal structures. So the tubule cysts of Sutton are dilatations of pre-existing space by the gradual accumulation of fluid produced either by secretion of the lining or the exudation of lymph and blood vessels. Hence they are really retention cysts and differ from cystomas in that they are mechanical rather proliferative.

The parasitic cyst is an enclosure of larva or a metazoan parasite such as tapeworm or trichina.

Apoplectic cysts occur from the extravasation of blood into an area.

Cholesteatoma is a teratoid growth about the meninges and about the hypophysis and becomes an epithelial sac which contains cholestrins and desquamated cells. It also occurs in the middle ear. These may come under a division called traumatic cysts or epithelial transplants.

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With this resumé of cysts for a background, discussion will be limited to the region of the epipharynx or nasopharynx. To be more specific in its description or in Dr. Lederer's words: "The superior wall or roof (fornix pharyngis) lies ventral to the pharyngeal tubercle of the basal portion of the occipital bone. It extends laterally along the body of the sphenoid and the petrous portion of the temporal bone in proximity to the foramen lacertum with its cartilaginous contents. The posterior wall slopes downward and backward, corresponding to the angle of the base of the skull anterior to the foramen magnum. The lateral limit is reached at a point near the osseous carotid canal. A sharp median turn is made at this point where the eustachian orifices become included in the anterior wall of the epipharynx.

"The uppermost portion forms a cul-de-sac, Rosenmuller's fossa (recessus pharyngis), which lies superiorly and posteriorly to the eustachian orifices within a few millimeters of the internal carotid artery.

"The pharyngeal bursa, when present in man, represents a vestigial structure, a cleft-like cul-de-sac extending in the median plane of the pharyngeal tubercle. Grouped around this bursa may be seen pharyngeal lymphoid tissue.

"The hypophysis cerebri develops as an evagination from the nasopharynx (Ratke's pouch) at a point which is identical with the recessus medius of the adenoid. This indentation grows through the sphenoid bone in the form of a stalk, terminating in a mass which becomes the anterior portion of the hypophysis. The stalk itself atrophies, but as in all embryonal structures of this type, remnants of the lumen occasionally remain. Such a remnant is, in occasional instances, found in the nasopharynx. It consists of a cyst located behind and above the recessus medius. This is the so-called pharyngeal bursa."

In the discussion of cysts of the nasopharynx with special reference to pathological cysts, there immediately arises a confusion in terminology, in histology, and in origin.

Dorrance in "The so-called Bursa Pharyngea in Man," has shown a confusion or a lack of unity in the nomenclature of structures in the nasopharynx. In his review of the literature, which is rather complete, is found the following historical survey:

"In 1838, Ratke described his pouch as the embryonic pharyngeal opening of the craniopharyngeal canal. In 1842, Mayer first described in man an invagination of the pharynx that is supposed to have been the structure subsequently called the bursa pharyngea. In 1877, Seesel described an invagination or pocket lower down in the pharyngeal wall, which was later studied by Mes-

baum who concluded that in the main it pertains only to the embryo and that it is of little or no importance. In 1882, Froriep stated that the bursa pharyngea is found at the attachment of the notochord to the primitive wall. In 1885, Tornwald drew the attention of clinicians to the bursa in a publication in which he held that disease of the bursa is responsible for many systemic disturbances, though perhaps in some of his cases, the lesions were pocketings of the pharyngeal tonsil. In 1886, Trautman called attention to a deepened furrow embedded between the ridges of the pharyngeal tonsil, and physicians now know that pathologic adhesions here can produce a cyst-like cavity.

"The discussion of these conditions went on for many years, and notable among the many discussors were Schwabach, Killian, Gradenigo, and Von Luchka. Dorrance said: 'The term bursa identifies a closed sac lined with endothelium, while the so-called bursa pharyngea is not a closed sac lined with endothelium, nor of mesodermal origin. Long usage, however, justifies the application of the term. The term bursa pharyngea designates a sac-like depression in the posterior wall of the nasopharynx just above the uppermost fibers of the superior constrictor muscle and usually extends upward and backward toward the occipital bone which it sometimes reaches with its apex. It is a well marked structure in the human embryo, although it seems to be rare as a distinct structure in the adult.'"

His conclusions in part were: (1) A true bursa pharyngea in adults is an independent structure and is not regarded simply as a median recess of the pharyngeal tonsil. (2) It does not develop from Seesel's pocket. (3) It does not develop from Ratke's pouch. (4) A true bursa pharyngea occurs somewhat frequently in man during embryonal life; it takes its origin from adhesions of the notochord to the pharyngeal entoderm. (5) It is probable that the bursa in adults represents persistence of the embryonal bursa, and may be the seat of inflammation and cyst formation.

Dorrance shows three definite structures in the embryologic state, listed from above downward as: craniopharyngeal canal, pharyngeal tonsil, and pharyngeal bursa. It is from these three vestigial structures that cysts become possible. The craniopharyngeal canal may not close completely but leave a part of the canal or stalk which may be walled off to become a cyst in Ratke's pouch; again, in the depressions or clefts of the pharyngeal tonsils there may be enclosures of infection to form a cyst or abscess (Tornwald's disease); or again, there may be a retention of material, infection, and secretion which gives rise to a retention cyst in the pharyngeal bursa. These three structures are in close proximity to each other, in fact, overlap, and consequently, it is difficult to determine which is infected unless the histological picture is studied and analyzed. The bursa is a depression normally lined with ciliated columnar epithelium as is the rest of the nasopharynx, hence we may expect a lining epithelium of the cyst. Retention cysts, in the folds of the pharyngeal tonsil are completely surrounded by adenoid tissue. The craniopharyngeal canal or hypo-

physeal stalk may contain a pharyngeal hypophysis or be an invagination and so a cyst.

Other pathological conditions such as abscess due to trauma, suppuration of the petrous apex or the lymph glands, degeneration cysts, dermoid cysts and cysts of branchiogenic origin as well as meningocele and encephalocele, must be thought of, diagnosed or ruled out.

Yankauer, in his paper in 1929, reported 155 cases. He claimed however that the involvement was due to suppuration in the remnants of adenoid tissue and not in the bursa pharyngea. Two-thirds of his patients were 20 to 40 years of age and 93 per cent had not had their tonsils removed. The associated symptoms were post-cervical adenitis and postnasal discharge in 66.5 per cent; occipital headache or pain in the back of the neck in 68 per cent; otalgia in 15 per cent and focal diseases in 5 per cent. He opened the lesions under direct vision and removed the excess lymphoid tissue with punch forceps and then painted the area with 20 per cent silver nitrate. His results were uniformly good. Woodward feels that he was in error in attributing practically all of them to abscess of the recessus medius of the pharyngeal tonsil.

In 1928, Hagens reported the occurrence of a typical bursa pharyngea in a man of 70 years, studied post-mortem. The cavity was 11x7 mm. and contained a cheesy mass of acellular material. An ostium was noted at the dependent portion, and microscopic section showed it to be lined with cuboidal epithelium. The wall of the sac was composed of dense connective tissue, sinusoidal vessels and well developed vessels. Small lymphocytes and plasma cells were noted throughout as well as several glands and lymph follicles.

Kully, in 1935, reported 88 cases of cyst and retention abscess of the nasopharynx, observed in a six year period, and stated that the scarcity of reports is due to failure in comprehension and diagnosis rather than to the rarity of the condition. Sixty-two of his cases were retention cysts with a definite cyst wall. The cardinal symptoms presented by his 88 cases were postnasal discharge, chronic pharyngitis and laryngotracheitis in 54.5 per cent, enlargement and tenderness of the posterior cervical glands in 30 per cent, frequently associated with stiffness and rigidity of the muscles of the posterior cervical region, occipital headache in 14 per cent, otalgia in 0.6 per cent, and tinnitus and moderate deafness in 0.8 per cent; a few had persistent fever or focal disease, and 25 per cent had no symptoms, the condition being discovered in a routine examination.

Woodward, summarizing his 14 cases, revealed the following: All lesions occurred in young adults. Four of them were retention abscesses of the median cleft of the pharyngeal tonsil. Ten were retention abscesses of the pharyngeal bursa and presented on inspection a smooth bulging surface, yellowish or white, situated high in the nasopharynx, and usually a little lateral to the midline. They were 1 to 2 cm. in diameter, and their retained secretions were under sufficient pressure to produce a taut anterior surface. Postnasal discharge, sore throat and cough were the symptoms in four cases,

deafness and tinnitus in five, postcervical pain and adenitis in one, otalgia in three, a sense of soreness in the nasopharynx in three, and focal disease with no localizing symptoms in one. The last mentioned was interesting because of a persistent chorioretinitis which forced the student to leave school. The bursa pharyngea was opened with punch forceps and a hemolytic and non-hemolytic staphylococcus, a hemolytic and non-hemolytic streptococcus, a streptococcus viridans and a micrococcus catarrhalis were found. An autogenous vaccine was made and used. The eye cleared and the patient resumed his work shortly.

Two years ago last autumn a paper was presented at the Academy of Otorhinolaryngology and Ophthalmology in Chicago which called attention to the region of the nasopharynx and emphasized its neglect. This stimulated a routine examination in every eye, nose or throat case at the Illinois dispensary at the Education and Research Hospital with the result that three cases were

discovered, photographed, and treated during the first month. I have seen two cases in private practice.

CONCLUSION

1. The pharyngeal bursa is occasionally present.
2. Tornwald's disease is perhaps more frequent.
3. These two overlap so that it requires histological examination to tell which it may be.
4. These give symptoms which are relieved by drainage.
5. Other conditions may be present in the nasopharyngeal regions which must be thought of and ruled out.
6. These cysts and complications are not found unless looked for.
7. The nasopharynx of all postnasal drip patients should be examined routinely.
8. The direct examination of the posterior and superior wall of the nasopharynx is simple with a Yankauer speculum.

The Medical Profession's Responsibility in the Control of Cancer*

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AT a meeting of the subcommittee on cancer of the South Dakota State Medical association held in conjunction with the South Dakota Women's Field Army of the American Society for the Control of Cancer, it was decided that the chairman of the committee should prepare and present to the public a series of cancer talks. Arrangements were finally made with the program manager of WNAX to broadcast these talks. In all a series of ten broadcasts was made, all but one of them given by the chairman.

It was stated to the public that these talks constituted part of a program initiated by the cancer committee of the South Dakota State Medical association in cooperation with the South Dakota Women's Field Army of the American Society for the Control of Cancer and the State Board of Health. This part of the committee's program was designed to awaken public interest in the problem of cancer control. In other words, it was hoped that there might thus develop a "cancer conscious" public state of mind, which would evolve into a well organized movement between interested laymen and the medical profession, and eventuate in effective control of cancer in South Dakota. This state is lagging well behind many other states in this matter.

While these talks were in preparation it occurred to me that the medical profession needed a little stimulus along the same lines. Repeatedly to admonish the lay

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public that intelligent cooperation with the medical profession is essential to success of this contemplated program, and at the same time to realize that many physicians were not wholly prepared for such cooperation, placed us in a somewhat embarrassing position. Not only is there a vast amount of indifference on the part of the medical profession concerning cancer and the place it should occupy as a public health problem, but there exists altogether too much ignorance regarding cancer itself.

Predicated on this belief, this paper is presented in the hope of arousing sufficient active interest in the problem of cancer control to effect a worthwhile organized movement in South Dakota which will result in greatly lowering cancer mortality and cancer incidence. Significant strides in this direction have already been made in many states which are more or less fully organized.

First, I shall give you a brief history of the development of this organized movement for the control of cancer. "Twenty-eight years ago a group of physicians met to discuss the problem of cancer control. Out of their deliberations grew the American Society for the Control of Cancer. It was officially endorsed by the American Medical Association through the house of delegates that same year—1913. In 1916, the American Medical Association noted the growing interest of other organizations in cancer control and, fearing the loss of effectiveness from scattered and uncoordinated effort, recommended that the principal campaign against cancer

be carried out by the American Society for the Control of Cancer.

"To meet the great need of reaching into every community in the land with cancer control education the American Society for the Control of Cancer launched the Women's Field Army, in 1936, to build throughout the Nation an enlightened lay group through the dissemination of sound, conservative information on the methods of cancer control.

"In each state the Field Army is under the direct guidance of the State Medical association whose cancer committee becomes the state executive committee of the Field Army." The Field Army is composed of lay women, many of whom are nurses or doctors' wives. The fact that the activities of the Field Army are guided by the state executive committee composed solely of physicians, indicates the high ethical standard of the organization.

The American Society for the Control of Cancer, though a lay organization, has on its board of directors 42 of the outstanding medical authorities of the country. Listed among these we find such names as James Ewing, Ludwig Hektoen, Thomas Parran and Wm. C. White. The impetus which gave rise to this organized effort on cancer control was the realization that this dread disease continues to exact a greater and greater toll of human lives; the recognition that early cancer can be cured in a large percentage of cases; that its development can be prevented on a large scale; and finally, a realization that effective control of cancer can only be attained by education of the lay public to a degree that would encourage active coöperative participation with the medical profession.

Thus far, South Dakota has put forth only desultory efforts at organization. Some neighboring states such as Minnesota, North Dakota, Iowa, and Missouri, have initiated such effective programs that excellent results are even now becoming apparent. As indicated before, no program of this kind will succeed unless it has the moral and active support of the medical profession.

Part of the indifference manifested by the medical profession about cancer and the possibility of its control is predicated on the widespread belief among physicians that only rarely can cancer be cured. Ignorance of those conditions which tend to develop into cancer is another factor of prime importance, so that prevention of the disease is not practiced to a sufficiently great extent. It is possible to recognize a danger and yet be indifferent to the development of safeguards against it if failure to recognize the possibilities of such protection exists.

Cancer has probably always existed among humans. History records its appearance as far back as 4000 B. C. However, it has been only within the last 20 or 30 years that intelligently directed efforts in cancer clinics and research laboratories have resulted in any very valuable contributions to our knowledge of this disease.

Our present knowledge may be summarized as follows:

1. Cancer, which, not many years ago, occupied seventh place as a cause of death, now stands

second only to heart disease which leads all other causes.

2. It is not caused by a specific parasite or directly by any infection.
3. It is not inherited, though there is some reason to believe that the tendency to acquire it may be.
4. It almost always, if not always, develops on the basis of previous injuries (disease) affecting localized areas of the body.
5. It appears likely that in the breast, and possibly in the prestate and uterine mucosa, cancer may develop due to the irregular and unbalanced activity of the hormones which normally control these structures.
6. The fact that certain hydrocarbons regularly produce cancer in experimental animals suggests the possibility that certain like substances elaborated in the body may be responsible for the development of some human cancers.
7. That early recognition and thorough treatment of cancer by recognized measures will greatly reduce the mortality of cancer is attested by recent reports from some of the best cancer clinics.
8. That cancer incidence can be greatly reduced by recognition and removal of those localized lesions, recognized as potentially cancerous, is likewise evident.
9. The recognized treatment of cancer consists of surgery, X-ray, and radium, singly or in combination. Hormones are being tried in the treatment of certain cancers and offer some promise. Attempts to prepare radio-active substances having a selective affinity for cancer cells are suggested in the light of what is being accomplished with radio-active phosphorus in the treatment of leucemia.

As stated previously, cancer mortality can be greatly reduced by recognition and proper treatment of the disease before it has spread widely into contiguous structures or through the lymph and blood streams to distant parts. Apriori, the removal of a two months old cancer offers a better chance of recovery than does treatment applied to a four months old cancer. More and more cancers are being cured because more and more cancer victims are seeking therapeutic relief at an earlier period. This is due to a better understanding of the disease, made possible by the activities of such agencies as the Women's Field Army of the American Society for the Control of Cancer.

In this connection, it is admitted that cancer-educational programs are apt to arouse fear in the minds of some of the lay public. A certain amount of fear of cancer is a good thing. An informed person who fears the beginning of cancer need not fear cancer. A young woman listening to a talk on cancer of the breast may, for the first time, discover that she has a lump in one of her breasts. She may be fearful; fearful enough, in fact, to consult a qualified doctor who will advise her what to do. The lump may or may not be actual cancer. Had this lump gone unnoticed it might have developed

dangerous attributes no matter how innocent it was in the beginning. Is it not better, then, that fear was responsible for her trip to the doctor?

It has been estimated that if all the available knowledge about cancer prevention and control were used, more than 60,000 deaths from cancer could be prevented each year in this country alone.

The failure to recognize the early or incipient cancer is not the lot of a few but of many physicians. Only the well trained, experienced expert can, with any assurance, make a diagnosis of early cancer, in the majority of cases, from its gross attributes alone. Casual exposure to cancer pathology in the classroom, surgical clinic or hospital wards, does not qualify anyone to this degree. Only years of special training under expert guidance, and the study of abundant material imparts the requisite knowledge. Any physician, perhaps any second year medical student, should and probably can recognize a fully developed malignant neoplasm. Such late recognition, however, does not help the victim, nor does it reflect any special credit on the diagnostician. Should the casual surgeon fail to recognize the true nature of a tumor he may fail in two particulars; he may perform a radical operation when simple excision is all that is necessary, or he may do a simple excision when radical operation should be done. Both of these things are bad, though from the standpoint of the patient it is better to sacrifice much tissue needlessly than, after a comparatively minor operation, to have recurrence of the tumor process followed by early death. Most anyone with skillful fingers, and plenty of assurance, can operate well. All of us have seen good surgeons who are not particularly good technicians and fine operators who are not good surgeons. A good surgeon, first and foremost, is a good pathologist. Talking from an experience of many years as a tissue diagnostician, I say advisedly that there are men doing surgery who all too frequently ignore basic principles applicable to correct diagnosis, too often relying only on superficial and confusing symptoms. May I cite a few examples to indicate what I am trying to say:

A hysterectomy is performed on a woman past the age of menopause in the belief she suffers from cancer of the uterus. The diagnosis is made on the basis of more or less severe bleeding from this organ. Uterine scrapings are not procured and submitted to a cancer expert for study. The whole uterus is later sent in with the instructions: "examine for malignancy." Examination reveals a practically normal uterus, except that the endometrium shows the effects of overstimulation by follicular hormone.

Another uterus is removed from a woman of the child-bearing age. Diagnosis: malignancy, based only on evidence of unexplained bleeding and a foul discharge. A piece of placental tissue murally implanted is discovered by the pathologist. No malignancy is evident. Curettage, and microscopic examination of the material thus obtained would have established a correct diagnosis and an unnecessary maiming operation would have been avoided.

A woman presents herself to a physician with symptoms referable to the uterus. Examination reveals a polypoid-like tumor of the cervix. This is snipped off but not subjected to microscopic examination. A month or so later the woman returns to this physician with increased and more suggestive symptoms. The cervix at this time is conspicuously cancerous; the uterus is removed. Shortly after the woman dies of metastases. She had a grade four carcinoma.

A man in the early fifties consults a physician complaining that he is suffering from slight dyspepsia. He had always been a hearty eater and at no time previous to his visit to the doctor had he cause to worry about his stomach. The physician, without even making any special study of the condition, gives the patient a digestive compound and advises limitation of diet. For a short time this patient gets along with little gastric distress. Then his symptoms rapidly grow worse. A friend advises him to go to a well-known clinic for a "check-up." At this clinic he submits to gastric analysis, repeated X-ray studies and gastroscopy. It is discovered he has an inoperable cancer of the stomach. Is it not possible that had the first physician submitted this patient to these same examinations and proved the presence of cancer that a life-saving operation might then have been performed?

Such instances as these could be multiplied many times. They tell their own story and indicate what should or should not be done in similar cases. Every physician, no matter how expert he may be in his chosen field, makes an occasional error in diagnosis. If such an error comes after all available means of making a diagnosis are exhausted, no blame can be attached. It is the failure to realize the advisability of utilizing these diagnostic aids or the failure to employ them when at hand which merits criticism.

We have said that most if not all cancers begin in tissues altered by various agencies or agents. It is the recognition and effective elimination of these chronic lesions upon which cancer occasionally develops that constitutes the most important consideration in the prevention of cancer. Taking for granted that most cancers have their origin in such lesions, it is the duty of every physician fully to acquaint himself with them. The cancer-conscious physician when called upon to give a physical examination of any individual will look for them, especially in those who have reached the cancer-age; in women who have borne children or in anyone presenting suggestive symptoms. A brief consideration of some common cancers and cancer-producing processes might emphasize what I am saying.

The skin and those structures opening onto the surface of the body offer a rich field for the presence of potentially cancerous, precancerous, or even early cancerous processes. Most of these lesions, being readily accessible to careful inspection and other methods of study can be easily recognized by competent physicians. Ninety per cent of the cancers of the skin develop on those areas most constantly exposed to the irritating

influences of the sun's rays, wind and dust, viz., on the face and neck. They are found mostly in those individuals who live an outdoor life, such as in farmers and sailors. Most of them occur in men. Cancer of the skin may have its beginning as a chronic skin disease, old skin injury, scaly brown areas on the face, neck or back of hands which crack or ulcerate, old ulcerations which do not yield to simple topical applications, or from large warts, particularly those situated on the hands where they are subjected to irritation and infection, and from moles, pigmented or otherwise. These lesions should be effectively removed by recognized measures, particularly if they become irritated and begin to grow. The all too common practice of removing warts (papillomata) and moles by cauterizing substances, by burning or even with the electric needle should be discouraged. These agents and agencies may incite an inactive growth to malignant activity. Even the injudicious employment of X-ray or radium may change some comparatively innocent process into a malignant one.

Cancer of the lip, almost always on the lower lip, and usually in men, begins as a slight scaly roughness without induration. It bleeds easily following slight trauma, scabs over, does not yield to simple treatment, finally ulcerates and becomes indurated at its base. It should be effectively removed before it reaches this stage. Cancer of the tongue, cheek, gums, and so forth, develops from chronically infected areas, from prolonged irritation as from snaggy teeth, poorly fitting dentures, and effects of quids of tobacco held in one place between the gums and cheek, a practice of some *he* men. Any persistent lesion here should be expeditiously eliminated together with all predisposing factors in the oral cavity if cancer is to be prevented. Very early recognition and treatment of cancer of the lip, tongue, and similar structures, is even more imperative here than in many other places, such as those of the skin, for instance.

Cancer of the uterus is of frequent occurrence. Ninety per cent of such cancers are cervical. These begin at an earlier period than corpus cancer. They are also much more rapidly growing and malignant. Most authorities agree that cervical cancer is definitely related to birth injuries, endocervical infections and the like, though some good men contend otherwise. Women who have borne children should be examined frequently and all erosions, ulcerations, or other suggestive abnormalities corrected. Here, good practice dictates the procuring of biopsy material in any case where doubt exists as to the true nature of the lesion.

Cancer of the female breast occurs most frequently in unmarried women and is apt to occur earlier than cancer of the uterus. While some of these cancers may be the result of chronic infections or trauma, it now appears that the most potent factor leading to their development is endocrine in origin. Those hormones which determine the anatomical and physiological attributes of the breast may act in an irregular, unbalanced manner, giving rise to fibroid hyperplasia, localized or otherwise, or to gland and duct-cell hyperplasia. The hyperplasias of gland and duct-cell, so commonly evi-

dent in the breast of older women and which show characteristics of so-called cystic mastitis, all too frequently appear to terminate in cancer. A single breast tumor, especially in a young woman, is more apt to be malignant than multiple tumors. Many breasts, especially after the menopause, present a fairly distinct, resistant, nodular area or areas. These nodules, more often than not, are innocent in nature. Often they are not neoplastic. Most encapsulated tumors are not malignant. A few may present the microscopic attributes of malignancy. Well circumscribed, freely movable tumors are seldom, if ever, malignant. Any tumor-like process through which light can be transmitted is not malignant. Any fixed tumor or one which is not well circumscribed should arouse suspicion. Any tumor which rolls under the cutting blade is probably not a cancer. On the contrary, any area, no matter how small, of board-like hardness and which does not recede from the cutting edge of the scalpel, is a cancer. Enlarged axillary lymph nodes, even in the presence of breast lumps, does not always spell cancer. If these nodes are of comparatively rapid development, soft, yielding, and painful, they represent inflammatory hyperplasia. Cancer nodes usually develop slowly, are small to begin with, are seldom if ever painful, and are very hard.

Reverting again to the specific problem of cancer control, I shall end this discussion.

South Dakota, like all other states, has a large death rate for cancer. Here, as elsewhere, it stands second among all those diseases from which humans die. Cancer takes the lives of many men and women during the most active, useful period of their life. It is time that the medical profession realizes this, and puts forth concerted efforts to help solve this grave problem. Only a few men of our profession specialize in cancer pathology and cancer treatment, but each and every physician can and should take an active part in the control program.

Most physicians stand high in their communities, participating in many projects which tend to make their communities better and happier places in which to live. The leadership exercised by civic-minded physicians, often initiates thoroughly progressive, constructive programs of real worth to the communities. In many places the physician is looked upon as the real leader. The public is more apt to follow his leadership than that of most any other citizen. In matters of public health, it is his privilege, nay, it should be recognized as his duty to educate the public in health matters and launch control programs definitely directed toward safeguarding the health of his fellows. He should give not only his counsel, but some of his time in these matters, and should gladly respond to requests from various organizations for talks concerning safeguards of health.

The Women's Field Army of South Dakota, through its commander, Mrs. A. T. Tollefs, of Sioux Falls, hopes to organize practically every community in this state. Not only the moral support, but active participation of the medical profession is solicited. We hope this support will be extended in full measure. The present subcom-

mittee on cancer of the South Dakota State Medical association will be extended so as to include in its personnel at least one medical representative from each councilor district. Many problems developing on the basis of effective organization, and how best to extend cancer control so as to be generally worthwhile will come up next year and the following years. Then the committee working with the physicians of the state, the State Board of Health, the State Women's Field Army, and national organizations, must solve these problems. How to set up machinery so as to encompass within this program the benefits of organization such as a yearly, or semi-yearly physical examination of individuals, including those unable to pay for such service, is but one of the many things which requires solution.

I quote now from an editorial in the *Journal of the American Medical Association*¹ entitled "Prevention of Cancer in Physicians": "Almost one out of every ten deaths among physicians is due to cancer. . . . Since notoriously many physicians do not follow their own advice in having personal periodic physical examinations, J. A. M. A. 116:16, p. 1776.

many of these deaths from cancer might have been prevented by early diagnosis and treatment. In accordance with the belief that the periodic physical examinations of organized groups of apparently healthy persons may prove helpful in detecting early curable cancer, the American Society for the Control of Cancer proposes such a program for physicians through the local county medical societies which would make possible a complete physical examination once a year by qualified experts in the state. Such specialists, the society believes, could be selected by state cancer committees. One month during the year could be set aside for the examinations. A supplementary advantage would be that physicians would be practicing what they preach. As a result, a powerful influence would be exerted on furthering the educational program of prevention of cancer by periodic examination."

I am sure I voice the sentiment of the cancer committee when I say that we shall be glad to receive suggestions, criticisms, as well as assistance, from any physician who has anything to offer.

THE ADJUSTMENT OF MARITAL PROBLEMS

The old time family doctor used to be very much interested in the adjustment of marital problems, and a continuation of this interest on the part of the physician today would be well worthwhile, says Lowell S. Selling, M.D., Ph.D., Dr.P.H., F.A.C.P., of Detroit, in *The Journal of the Michigan State Medical Society* for October, 1941. It must be remembered that the married couple are two integrated but individual organisms. The treatment of domestic relations problems lies in three spheres: First, premarital treatment, which involves prevention of marital discord by advice and correction of defects before marriage. Second, prevention of marital conflict after marriage, which is concerned with the correction of emotional maladjustment or physical ailments. Third, and the largest sphere, lies in the correction of pathology which results in argument, disagreements, false fantasy life, and infantile concepts of marriage. Six general causes of domestic difficulty are pointed out, and suggestions are made for the treatment of each. Some of these can be handled by the general practitioner. Others the general practitioner can recognize and refer to the psychiatrist for specialized adjustment. Early recognition and treatment of sources of marital maladjustment is urged, and broad rules for the general practitioner to follow in handling these cases are briefly laid down.

Pathological Significance of Discharge from the Non-Lactating Breast*

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A REVIEW of the literature pertaining to various types of discharge from the non-lactating female breast revealed a marked divergence of opinion concerning the pathologic significance. This lack of agreement as to the underlying cause of discharges, whether sanguineous, serosanguineous, purulent, wax-like, clear, or of a colored serous type, served as the stimulus for this study. A review of surgical cases of this syndrome at St. Luke's and at St. Mary's hospital was made for the years from 1926 through 1939. This work was undertaken as a comparative study of diagnosis and results were observed both in other studies and in this series. It was done with the hope that perhaps a more definite relation between the type of discharge and the pathologic condition could be found.

In such a study, a pathologic classification of anomalies associated with bleeding or discharge from the nipple is necessary. The following pathologic diagnoses culled from the literature and the anomalies observed in the patients in this group should cover all such conditions:

1. Malignant
 - a. Carcinoma of the breast
 - b. Sarcoma of the breast
2. Benign
 - a. Chronic mastitis
 - b. Adenoma
 - c. Fibroma
 - d. Adenofibroma
 - e. Desquamative cyst
 - f. Infected cyst
 - g. Galactocele
 - h. Chronic infection of the milk ducts
 - i. Vicarious menstruation
 - j. Abscess of the breast
 - k. Varicocele
 - l. Trauma
 - m. Tuberculosis

In view of such a considerable group of anomalies that may cause discharge or bleeding from the nipple, it would hardly be expected that a definite relation between the type of discharge and the pathologic condition would exist in all cases. However, some such definite relation might be present in a certain number, particularly in the larger groups, if a characteristic type of drainage could be consistently found.

A spontaneous secretion from the non-lactating breast is usually viewed with alarm by the patient and if the discharge continues it is primarily responsible for the

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patient's seeking medical advice. That this is true in a considerable number of cases favors early intervention when there is a possible malignant condition. The dictum that a spontaneous discharge from any non-lactating breast is definitely due to pathologic change of some sort is well established. It is also true that such alteration as may exist must begin in or involve secondarily the milk ducts, in order that the discharge or blood may reach the surface through the nipple.

Writers, from time to time, have expressed definite opinions regarding the significance of the various types of discharge. As early as 1905, Bloodgood advocated the removal of every palpable tumor of the breast and diagnosis with frozen section. He stated that a tumor noticed for less than one month has an 80 per cent chance of being benign, and that a unilateral serous discharge with tumor is often malignant. In 1908, Bloodgood revised his opinion and said that a discharge from the nipple of a non-lactating breast should be looked upon as symptomatic of a benign lesion and not of carcinoma. He further said that less than one per cent of carcinomas of the breast have bloody discharge from the nipple. Stowers expressed the opinion that bloody discharge in the absence of trauma or tumor is most likely caused by papilloma of the milk ducts. Adair, on the contrary, considered such a discharge as indicative of carcinoma involving the ducts. He stated that in 52.8 per cent of cases of bleeding from the nipple cure was effected by local removal of the tumor. He found the average age of patients with papillary cystadenoma in his series to be 42 years, while that of patients with carcinoma was 54 years. According to his experience, the discharge in cases of sarcoma is dark stagnant blood. He stressed the important points in differentiating duct papilloma and cystadenoma from other lesions as follows:

1. The characteristic position of a tumor within or at the edge of the areola.
2. The discharge is serous becoming sero-sanguineous or bloody by pressure or trauma over the tumor.
3. There is no nipple retraction, attachment to skin or other signs of cancer.
4. Transillumination test will show an opaque tumor, *sharply* outlined.

He further pointed out that papillary cystadenocarcinoma is of a low malignancy until late, and that it is usually located at the periphery of the breast. Discharge is not commonly present, but if it occurs it is usually dark, stagnant, and bloody. Miller and Lewis stated that when the discharge from the nipple is serous or

blood-stained, intracanalicular papilloma is probably the causative factor. When it consists of frank blood, the lesion is most likely carcinoma, and when it is mucoid, thick and purulent or colored, a chronic cystic mastitis is in all probability the associated anomaly. According to the opinion expressed by these authors, there is about the same proportion of benign as malignant tumors with discharge. Von Sarr stated that there is no definite relation between malignant lesions of the breast and bleeding from the nipple. He further said that such bleeding has no diagnostic significance and that it is imperative that the primary cause be accurately determined. A serous drainage, he said, might be associated with grave pathologic conditions.

The work of Judd in 1917 and of Miller and Lewis in 1923 gave, perhaps, the most definite figures regarding the relation of discharge to pathologic observations. Judd's report covered 100 cases, in 50 per cent of which the discharge was sero-sanguineous or sanguineous. In this group, 54 per cent of the lesions were carcinoma, and in 24 per cent there was a non-hemorrhagic discharge; of these, 60 per cent were carcinoma, 28 per cent mastitis, 8 per cent papilloma and 4 per cent simple cyst. Among the lesions in this group, then, approximately 45 per cent of those associated with discharge proved to be malignant. Miller and Lewis reviewed 700 cases of tumor of the breast; in 40 cases in this series the tumor was accompanied by some form of blood-stained discharge. In 13 of the 40 cases in which discharge was present the lesion was benign, and in 27, or 66 per cent, malignant. Of the total number of benign tumors, 5.7 per cent were accompanied by discharge, as compared with 6.3 per cent in the malignant group. One-half the benign lesions with discharge were papillomatous, either duct papillomas or papillary ingrowths in cystic mastitis. In almost half the cases, i. e., 17 of 40, the discharge was bloody, and in 10 of these 17 the growth was malignant. In 11 cases of the group of 40 there was sero-hemorrhagic discharge, and in eight of these the lesion was malignant. In 22 cases the discharge was present before there was a palpable tumor, and of the tumors in these 22 cases, 80 per cent proved to be malignant.

Deaver and McFarland went so far as to say that a patient with spontaneous emissions of serum from the nipple has ample cause for worry. They found 25 per cent of patients with intracanalicular papilloma to have a serous discharge and expressed the belief that discharge in cases of carcinoma is not pathognomonic. Gross stated that he observed a thin watery discharge in 10 per cent of all cases of sarcoma. Dickinson, in 1922, expressed the opinion that blood from the nipple is neither diagnostic nor prognostic. Best, Hicken and Hunt asserted that a spontaneous secretion from the non-lactating breast is an abnormal pathologic or physiologic condition and a definite warning which should be heeded. They stated that hemorrhagic or serosanguineous discharge from the nipple is indicative of pathologic change and associated with such a variety of pathologic conditions that it is of little diagnostic value.

Max Cutler recognized two problems: those of serous or sero-sanguineous discharge with and without tumor. He stated that ductal carcinoma is rarely found with discharge if no tumor is palpable. He believed also that papilloma is a definite stage in the development of carcinoma.

The multiplicity of opinions regarding the significance of a characteristic type of discharge is evident, and statistical studies in the literature show wide divergence of opinion. The hodge-podge of ideas and statistics verifies the suspicion that perhaps no definite characteristic picture or mode of behavior can be found in cases of pathologic discharge from the nipple. The consensus of most students of this condition appears to be that a serous, watery or sanguineous discharge may, and frequently does, indicate serious pathologic changes.

The recent work of Hicken, Hunt and Best presents a comprehensive review of the subject as well as an interesting and valuable diagnostic method. This method, of mammographic roentgen study, has yielded satisfactory diagnostic results in their hands, and is worthy of more general application. However, it would seem that the technical difficulties involved might preclude its universal use.

Before their work, the most specific tests in addition to palpation consisted of transillumination and the microscopic study of the discharge. Today the feeling among most surgeons is that, regardless of diagnostic tests, any persistent unilateral discharge from the non-lactating breast in the female, with or without tumor, calls for at least a biopsy together with excision of the questionable and offending area, and, of course, more radical surgical treatment if indicated.

The fact should be emphasized that the color, quantity, consistency and odor of a discharge from the nipple may be altered by various circumstances. When the pathologic condition responsible for the discharge is near the surface, close to the nipple, the secretion may be frankly sanguineous. When the lesion is somewhat deeper, the secretion, though sanguineous at the source, may become sero-sanguineous at the time it is discharged, owing to the distance it has to travel and the time required for reaching the surface. It is a fact that a discharge from a deep-seated source may take considerable time in reaching the surface. This may cause it to appear as somewhat serous, yellow-greenish brown or chocolate. The addition of desquamated epithelial cells, leukocytes and tissue debris may also alter the consistency of the drainage. If infection is superimposed on the stagnated blood and purulent matter is mixed with the discharge, it will be much thicker and may have a pronounced odor.

Examination of patients complaining of discharge from the nipple should be painstaking and complete. The breast should be palpated with the patient in the prone position. If a tumor is present, it is most likely the seat of the discharge and can be easily localized. If, however, no tumor can be palpated, manual exploration

TABLE I.
Pathologic Diagnoses in 468 Cases of Operation on the Female Breast

Adenoma	14
Cysticadenoma	4
Cystic fibroadenoma	1
Fibroma-adenoma	58
Fibroma	14
Cystic fibroma	1
Cyst	14
Papillary cyst	1
Blue dome cyst	1
Papilloma	14
Mastitis	151
Abscess	15
Hypertrophy of the breasts	5
Galactocele	1
Fissured nipples	1
Paget's disease	3
Axillary breast	1
Hemangioma, cavernous	1
Tumor, unspecified	17
Carcinoma	52
Carcinoma with metastases	62
Adenocarcinoma	2
Fibrocarcinoma	1
Carcinoma, scirrhus	15
Sarcoma	2
Lipoma	5
Mazoplasia of the breast	1
Tuberculosis of the breast	1
	468

TABLE II.
Further Data on 468 Cases of Operations on the Female Breast

	No. of Cases	Pct. of Total Cases	Pct. of Cases of Discharge
Some type of discharge	40	8.5	—
Hemorrhagic discharge	26	5.5	65
Non-hemorrhagic discharge	14	2.9	35
Tumor	31	6.6	—
Pain	18	3.8	—
Previous pregnancies	30	6.4	—

of the breast starting at a given point and encircling the entire circumference will localize one point where pressure will produce secretion from the nipple. After the offending area has thus been localized, simple excision of a wedge-shaped piece of breast tissue and immediate biopsy will determine the cause. The fact is recognized that examination of the discharge and transillumination are valuable aids in diagnosis, and the mammographic method of Hicken, Best and Hunt has yielded excellent results in their hands. It is believed, however, that careful manual examination followed by removal of a biopsy specimen and excision of the offending area furnishes the quickest, safest method of handling all mammary tumors with or without discharge. Removal of the specimen is sufficient in many cases, but when the pathologic changes indicate it, further surgical intervention should be done at the time.

In this series, 468 cases of tumors of the breast were studied. In 40 cases, or 8.5 per cent, there was some type of discharge. With respect to quantity the discharge varied from slight, in 20 cases, to moderate, in 19 cases,

TABLE III.
Types of Operations in 40 Cases of Discharge from the Nipple

No. of Cases	Operation	Ave. Weight of Specimen Gm.
15	Excision of tumor	178.0
13	Simple mastectomy	300.5
12	Radical amputation	820.0

TABLE IV.
Types of Discharge from the Nipple as Related to Pathologic Observations

Type of Discharge	Carcinoma	Papillomas	Chronic Mastitis
Sanguineous	11	10	7
Purulent	2	1	.
Watery	1	1	1
Wax-like	1	.	.
Serous	.	.	4
Mucopurulent	.	.	1

TABLE V.
Age of Patients Having Discharge from the Nipple

	Years
Oldest patient	82
Youngest patient	27
Average Ages	
Patients with:	
Carcinoma	54
Papillomas	49
Chronic mastitis	48
All patients	51

and marked, in only one case. In 26, or 5.5 per cent, of the 468 cases there was sanguineous or sero-sanguineous discharge, that is, in 65 per cent of the 40 cases in which there was some type of secretion. In 13 of these 40 cases, or 2.7 per cent of the total, the discharge was watery; in four, non-hemorrhagic; in four, purulent; in three, wax-like, and in five, serous, varying from clear to greenish brown. Tumor was present in 31, or 77 per cent, of the 40 cases. In 23 the growth was in the right breast and in 17 in the left. In 18 cases, or 45 per cent, the patient complained of pain, of which the average duration was five months. The longest duration of pain was one year, and the shortest three days. In 24 of the 40 cases the patient was a multipara, and in 16 nullipara.

About the only definite conclusion that can justifiably be drawn from these observations is that the type of discharge does not in any way accurately indicate the pathologic condition which may be found. It is imperative that the discharge be used, like any other symptom or physical finding, as one more link in the evidence essential to an accurate diagnosis. This is, of course, ideal and is impossible of fulfillment in all cases. The safest and, after all, the most conservative procedure should be a biopsy done as soon as possible and followed by excision or simple or radical amputation. A nodule in the discharging breast may or may not be malignant but, as in cases of intracanalicular papilloma, cystadeno-

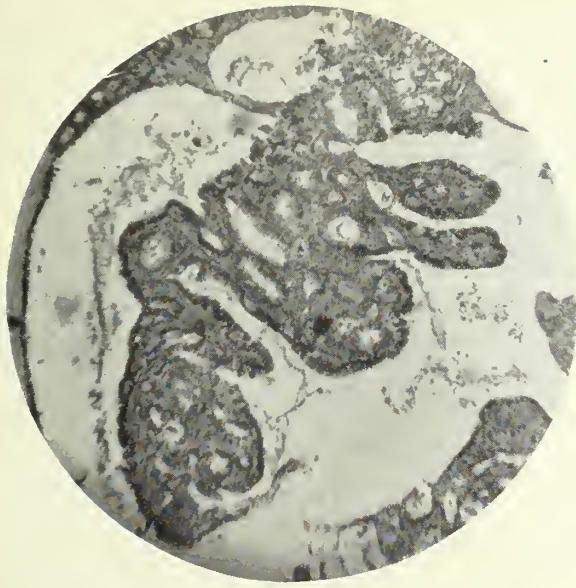


Fig. 1. Papillary ingrowth into large milk duct.

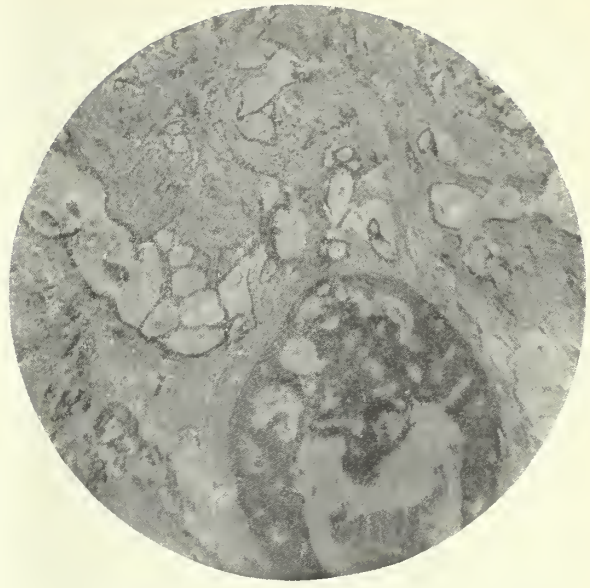


Fig. 2. Invading growth in tiny spheroid carcinoma. Same as fig. 1.

ma or chronic mastitis, may be the basis for later malignant change. This fact becomes one more reason for strongly advising immediate surgical interference.

The following case report is included to emphasize the extreme importance of the earliest possible accurate diagnosis:

The patient, a 44-year-old woman, was married and had never been pregnant. She complained of an intermittent reddish-brownish discharge from the left nipple of about 16 months' duration. Six weeks previously she had thought she felt a peanut-sized lump lateral to the areola.

Examination of the left breast with the patient in the prone position revealed a mass the size of a small marble just lateral to the areola. On moderate pressure in this region a brownish watery discharge exuded from the nipple. Pressure on other points of the breast produced no discharge, and there were no other masses. The value for hemoglobin was 77 per cent; the red blood cell count was 4,000,000 per cu. mm., and the urine was normal.

Operation through a radial incision about two inches (5 cm.) long was performed on the left breast, and a section the shape of a piece of pie involving 30 per cent of the breast, was removed. The wound was closed with chromic catgut and dermal suture.

The pathological report, made by Dr. Arthur H. Wells, was as follows:

Gross Examination: There was an irregularly shaped mass of breast tissue measuring about 4 by 5 by 7 cm. Approximately 15 small, hard, slightly nodular, discrete, shot-like areas were observed scattered throughout the specimen, apparently located in the larger tubules and probably due to tiny papillomas. These masses ranged up to 3 mm. in diameter. The intervening breast tissue was made up, for the most part, of fat and a little glandular tissue.

Microscopic Examination: All the small nodules just described and many more, microscopic ones, were ducts distended with proliferating papillary glands of a benign type, which frequently filled the duct completely. There was also a moderate lymphocytic reaction.

In one section a small area of wild invasion by anaplastic epithelial cells in small clumps was observed.

The diagnosis was: (1) multiple papilloma of the breast, (2) chronic cystic mastitis, and, (3) scirrhous carcinoma of the breast.

The unusual feature in this case, finding and identifying a carcinoma at such an early stage, warrants further emphasis of the importance of early surgical intervention. The estimated actual gross diameter of this spheroid carcinoma was less than 3 mm., or about the size of two low power microscopic fields. Because of the small size and apparently recent onset of the growth it was felt that the operation had included all carcinoma-tous tissue and that further surgical procedure was unnecessary. The patient has remained well up to the present, one year after operation.

SUMMARY AND CONCLUSIONS

Four hundred sixty-eight cases in which operation was done on the female breast were studied. In this group, 40 cases of unilateral discharge in the non-lactating breast were found and observed from the standpoint of a possible relation between the type of discharge and the pathologic picture. These observations were compared with those in the literature.

It was noted that the operations were about equally divided among excision, simple amputation and radical amputation. There was only a slight difference in age between the patients with non-malignant and those with malignant lesions. No definite dependable relation was found between the type of discharge and the pathologic condition.

The weight of evidence both in the literature and in this study emphasizes the importance of early surgical intervention and immediate microscopic examination in order that the proper diagnosis may be made and treatment carried out.

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Corn Dermatitis*

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CORN dermatitis, or "corn rash" so-called, is apparently limited to the workers in the corn canning industry. The exact cause is not known. Most of the work done on the problem thus far seems to be directed toward proving that the skin eruptions are caused by a yeast or a mold. In view of the known relationship between poison ivy and poison oak and inflammations of the skin, and the similarity of these lesions to those of corn dermatitis, it seems rational to inquire into a corn-skin inflammation relationship.

All the work of this study was done at the Minnesota Valley Canning Company's plants at Watertown, Winsted, and Cokato, Minnesota, during the months of August and September, 1939. In order to try to determine what role the fungi played in the etiology of this skin disease, attempts have been made to culture fungi from the skin of workers who have corn dermatitis. It was impossible to isolate a specific fungus.

CULTURE TECHNIC

Cultures were taken directly from the involved skin. The area to be cultured was wiped lightly with alcohol (75 per cent). The area was scraped carefully with a sharp scalpel or a small piece of skin was removed from a papule or scaly area. After heat-sterilizing a wire loop, it was rubbed over the scraped area or introduced di-

rectly into the middle of a papule. The culture was then transferred to a Sabouraud agar slant. These were incubated at room temperature. According to Dr. Henrici, "Those cultures which had a growth have yielded a variety of organisms, no two patients having the same fungi. All of them are common saprophytic molds and yeasts. I, therefore, conclude that they are accidental contaminants having nothing to do with the lesions on the patients."

Most of the dermatitis occurs in workers who have direct contact with the corn, with only a few exceptions (see table I). Among 1,396 employees, there occurred 201 cases of corn dermatitis. Fifty-seven, or 29 per cent, were in males, and 144, or 71 per cent, occurred in females. Nine hundred twenty employees had direct contact with the corn at some time during the canning process. Among this group 181 (19 per cent) acquired the dermatitis. Of 354 pickers the dermatitis occurred in only 28, or 8 per cent of the group. The dermatitis occurred in 14 per cent of the employees. It is difficult to explain the fact that few pickers get the dermatitis. This may explain itself simply with further investigation. Severe inflammations of the skin in people working at some distance from the corn, though in the same plant, have appeared. It is possible that chance contacts exist that are not easily discovered. When the corn was dry and the weather was such that the skin could dry out readily, dermatitis seemed to decrease in severity. When the corn was wet and the skin of the workers was wet continuously all day, the inflammations became, or

*I am indebted to Mr. G. C. Scott of the Minnesota Valley Canning Company and to Dr. A. T. Henrici of the department of bacteriology and immunology of the University of Minnesota Medical School for the materials and bacterial studies of this report.

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TABLE I.
Occurrence of Corn Dermatitis in August, 1939

	Dermatitis				No. of Employees				Pct. of Total Cases			
	Winsted	Water-town	Cokato	All Plants	Winsted	Water-town	Cokato	All Plants	Winsted	Water-town	Cokato	All Plants
New cases	53	29							45	53		
Rash in '36, '37, '38	29	15							24	27		
No record	36	10										
Total cases	118	54	29	201	507	564	325	1396	23	9	9	14
Those who have contact with corn except pickers	80	48	25		189	266	111		42	11	22	
All those who have direct contact with corn including pickers				181				920				19
Including pickers	104	52	25		305	429	186		34	12	13	
Pickers alone				28				354				8
Men with dermatitis	43	8	6	57					36	15	21	29
Women with dermatitis	75	46	23	144					64	85	79	71

seemed to become, more deep-seated and harder to eradicate.

As might be expected, the greater percentage of cases occurred on the exposed hands and arms. The sites of predilection in order of their most frequent occurrence are: (1) flexor surfaces of the forearms, (2) cubital areas, (3) dorsum of the hands, especially interdigitally, (4) knees, (5) face, around mouth, (6) neck, (7) upper arms, (8) chest and back.

The lesions of corn dermatitis are multiple and resemble those of contact dermatitis (dermatitis venenata) from poison ivy. The lesions of corn dermatitis in order of their most frequent occurrence follow: (Pruritus preceded all the other symptoms.) (1) Erythema and excoriations, (2) erythematous papules, (3) white wart-like papules, (4) vesicles, (5) pustules, (6) erythematous macules, sometimes scaly or pustular, (7) secondary infections, (8) edema, (9) induration.

The first manifestation was invariably a persistent itching which preceded the next symptom by usually 12 to 24 hours. Exceptionally, no prodromal pruritus occurred. The occurrence of erythema was quite constant 24 hours after the pruritus. Vesicles were usually on the hands. Pustules were infrequent, appearing quickly with few intermediate stages. Edema occurred most frequently on the arms, and consisted of a raised red area, sometimes soft, and many times indurated, as if an actual infection were present. Secondary infections appeared on a few people who neglected early treatment. Two were serious. Following an earlier erythema, one patient had pustules on the face which drained spontaneously and were controlled with a saturated solution of aluminum acetate.

To determine which part of the ear of corn has the most influence in causing the dermatitis, "patch" tests were put on 46 employees. These tested the effect of husk, silk, kernels, and corn mash on the skin. The material was applied under a gauze dressing and left on the skin 48 hours. (The results are shown in table II.) At this time no conclusions can be offered

TABLE II.
Patch Tests Applied at Winsted and Cokato, August, 1939

Patch tests, Cokato	66	
Number of employees	23	
Positive reactions	6	9%
Husk	5	22%
Silk	1	5%
Corn mash	0	0
Patch tests, Winsted	46	
Number of employees	23	
Positive reactions	2	4%
Husk	1	6%
Silk	0	0
Corn mash	1	8%
Kernels	0	0
Total number patches	112	
Total positives	8	7%

from these results. The sensitivity of these patients to extracts of fresh corn by skin tests should be studied and doubtless will give more pertinent results. Twenty-two of 608 workers questioned gave a previous history of asthma, hay fever, or eczema (table III). Of these 22, three had had the dermatitis or acquired it during the current season.

TECHNIC OF PATCH TESTING

The skin of the flexor surface of either forearm was cleansed with soap and water. The material to be tested was placed on the cleansed area and covered with a gauze dressing (3 by 5 inches), fastened to the skin with adhesive. The patches were left on 48 hours. Positive reactors exhibited itching, redness, and red papules under the patch.

Frequent washing apparently is not a factor in the prevention of corn dermatitis. From the standpoint of the canning company, frequent trips to the washroom to wash hands and arms is not compatible with efficient plant operation. Though the workers should and do wash thoroughly when they leave the plant, they are in contact with the corn for so long a time that most of

TABLE III.
Correlation of Allergic History with Occurrence of
Corn Dermatitis

Total employees questioned	608	
Previous hay fever	18	
Previous asthma	4	
Previous eczema	0	
Allergic history (total)	22	3.6%
Corn dermatitis (among those with allergic history)	3	13%

the corn dermatitis develops while they are working and not after they leave the plant.

All those having dermatitis, except the pustular and oozing cases, were treated with calamine lotion containing one per cent phenol. Arms and legs were bandaged routinely with calamine dressings as soon as any symptoms developed. This alone prevented other lesions from developing as long as the arms or legs were covered. All infected cases were hot packed until the infection had disappeared. Because of the little coöperation which was received, due mainly to the fact that the workers were interested for the most part in sleeping when they left the plant, it was surprising that more trouble with infections was not encountered. To control those cases not responding to simple calamine dressings and bandaging and the pustular and oozing cases, a saturated solution of aluminum acetate was used effectively.

SUMMARY

1. Corn dermatitis seems to be the result of a specific skin sensitivity.
2. Direct contact is the exciting factor, with a few exceptions.
3. Wet corn increases the severity and number of the cases of dermatitis.
4. Most of the dermatitis occurs on the arms, hands, knees, face, neck, and thorax.
5. Severe cases occur when the "light" cases are not followed closely.
6. Prevention of corn dermatitis is successful if concentrated in decreasing the number of contacts by protecting exposed skin.
7. Frequent washing is not a factor in prevention.
8. Cultures were made directly from the dermatitis to Sabouraud agar to isolate any existing fungus.
9. Patch tests of husk, silk, kernels, and corn mash were made on 46 employees.
10. The sensitivity of these patients to extracts of fresh corn by skin tests should be studied.
11. Three patients had a positive allergic history and acquired the corn dermatitis.
12. All cases were treated successfully with calamine lotion containing one per cent phenol or with a saturated solution of aluminum acetate.



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The Treatment of Vitamin A Deficiency with Intramuscular Injections of Burbot Liver Oil*

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Minneapolis, Minnesota

IN the past, vitamin A deficiency was considered a rare condition and was clinically not recognized until severe eye changes such as hemeralopia, xerophthalmia or keratomalacia were present. These findings are the late manifestations in severe cases, and are rare, in comparison to the findings in milder cases of vitamin A deficiency. Recent investigations in this country and overseas have helped to revise the old conception. The rarity of the fully developed classical manifestations and the frequency of the milder forms of avitaminosis A was emphasized by Youmans,¹ Blackfan,² Jeghers,³ Blanchard and Zentmire,⁴ and others.⁵

It is now generally accepted, that hemeralopia (night blindness) is almost always the earliest manifestation of vitamin A deficiency. Frandsen⁶ and Spence⁷ have shown that even severe degrees of night blindness may be for years the only manifestation of avitaminosis A and that it can exist without any ophthalmoscopically demonstrable changes in the eye. Xerosis, dryness of the conjunctiva, was considered by Pillat⁸ as the second stage of this disease. However, before the xerotic stage in the eye is reached, cutaneous manifestations appear as have been reported by Youmans and Corlette⁹, Lehman and Rapaport.¹⁰ Dryness of the skin, due to a deficient function of the sebaceous and sweat glands, is the earliest, most frequent, but least characteristic change.

CUTANEOUS MANIFESTATIONS OF VITAMIN A DEFICIENCY (*Phrynoderma*)

The characteristic skin lesions were first described by Frazier and Hu¹¹ and later by Sweitzer,¹² Loewenthal,¹³ Goodwin,¹⁴ Nicholls,¹⁵ Brunsting and Sheard,¹⁶ and others.¹⁷ The lesions briefly summarized are as follows: The skin is at first dry and at times itches. Later it becomes rough, and spiculous papules of the hair follicles are found on the anterolateral surfaces of the thighs and posterolateral aspects of the arms. The papules then spread over the extremities, shoulders, lower abdomen and over the chest, back and buttocks. The flexor surfaces become dry, scaly and in some instances the skin assumes a dirty slate color. The hair may become coarse, dry, brittle, and fall out. In infants and small children there is only a dryness, scaliness, and shriveling, while keratinized plugs in the hair follicles are rare. Steffens, Bair and Sheard¹⁸ produced the dermatosis experimentally in healthy human beings.

Mild cases of avitaminosis A are much more common than is generally believed. Jeghers³ in a group of 162 medical students found 35 per cent with low photometer readings and 12 per cent with clinical manifestations of

the deficiency. His findings in order of their frequency were: night blindness, photophobia, dry skin, xerosis, blepharitis and follicular hyperkeratosis. As a result of the work of Edmund,¹⁹ Jeans,⁴ Snelling,²⁰ Park,²¹ and many others,²² we are now in the fortunate position of being able not only to recognize the subclinical cases of vitamin A deficiency, but also to verify the suspected condition, where other stigmata such as dryness, itching and follicular hyperkeratosis are present, and to treat them accordingly.

THE DIETARY REQUIREMENTS OF VITAMIN A

The vitamin A content of our diet is derived from two sources: namely from the carotene substances of the plant kingdom, and true vitamin A from certain animal tissues. Inasmuch as humans and animals are unable to synthesize either carotene or vitamin A, they therefore depend upon an exogenous supply. Being fat-soluble substances, they are absorbed by the lacteals of the intestine and enter the general circulation via the thoracic duct. Carotene is changed in the liver to vitamin A by an enzyme, carotenase, and according to Olcott and McCann²³ one molecule of carotene gives rise to two molecules of vitamin A. Vitamin A is as such stored in the liver until it is used by the body. In addition to inadequate intake of vitamin A, there are many conditions which may lead to a deficiency. Fever,²⁴ general infection,²⁵ rapid growth,²⁶ elevated basal metabolic rate,²⁷ pregnancy,²⁸ lack of bile²⁹ or pancreatic secretion,³⁰ changes in the gastrointestinal mucosa,²¹ or disturbances of motility of the gastrointestinal tract,²⁵ or liver disease,²⁵—all prevent or hinder the proper absorption or storage of this vitamin.

There is no unanimity among the different investigators as to the definite minimal and optimal requirements of vitamin A. Bocher³¹ stated that the Technical Committee of the League of Nations recommended that the diet for growing children contain from 6,000 to 8,000 international units daily. Lewis and Haig³² thought that a daily vitamin A intake of 18 to 25 international units per kilogram is sufficient for infants. Edmund and Clemmesen²² concluded that 1,370 units per person daily covers the exact minimal requirements. Funk and Dubin³³ placed the optimal requirements at 8,000 units for adults. Stiebling and Phipard³⁴ calculated that the ordinary American diet has 4,000 units daily for an adult, and they suggest that an adult should take at least 6,000 units daily and a schoolchild 5,400 units.

During the past seven months we observed 115 patients in the Minneapolis General Hospital Outpatient Department, all of whom belonged to the low income group and came to the clinic for various reasons but

*From the department of dermatology and syphilology, Minneapolis General Hospital.

TABLE I.

No. of Cases	Age	Sex	Race	Pruritus	Dryness of Skin	Follicular Hyperkeratosis
7	5—15	Female	2 Black 5 White			7
5	15—25	Female	White		4	5
76	25—40	Female 25 Male 51	5 Black 71 White	72	72	4
21	45—65	Female 3 Male 18	White	17	19	2
6	65—75	Female 1 Male 5	1 Chinese 5 White	6	5	1

TABLE II.

No.	Age	Sex	Race	Lat. & Post. Surf. of Upper Arm	Ant. & Lat. Surf. of Thighs, Calves	Back, Chest	Buttocks	Comment
1	6	Female	White	++++	+++	++		
2	11	Female	Black	++++	+++	++++	+++	post-scarlet fever
3	10	Female	White	++++	+++	++	+	
4	12	Female	Black	+++	+++	++	++	"
5	13	Female	White	++++	+++	++		
6	14	Female	White	+++	+++	++	++	"
7	14	Female	White	+++	++			
8	46	Male	White	+++	+++	+		
9	65	Male	Chinese	++++	++++	+++	+++	

complained or showed at the same time generalized pruritus, dryness of the skin or follicular hyperkeratosis. The distribution is shown in table I.

Biophotometric studies were done on all these patients. The Viconometer,* which although not as precise as the Birsch-Hirschfeld or Frober-Faybor instrument, was used and proved to be sufficient for routine clinical purposes. One must be aware of the sources of experimental error with any instrument. The method and technic described by Jeans and his coworkers⁴ was followed. The photometric examination was repeated several times, before the therapy was started.

Eleven patients of the 115 showed subnormal readings on repeated examinations. I considered skin conditions as a manifestation of a vitamin A deficiency only where subnormal photometric readings were present at the same time. Two patients had only a dry skin while a follicular hyperkeratosis was found in nine. The distribution of the lesion, age, sex, and the race is shown in table II.

TREATMENT AND COURSE

All of the patients with the exception of the Chinese were treated ambulatory. No dietary changes were made in order to evaluate the product used, neither was any local treatment given. The vitamin A used was sterile burbot liver oil fortified with vitamin A esters from a distillate of fish liver oils, containing 20,000 units of vita-

*Loaned through the courtesy of the Burbot Liver Products Company, Baudette, Minnesota.

**Furnished by the Burbot Liver Products Company, Baudette, Minnesota.

TABLE III.

Case No.	Normal Photo-metric Reading		Skin Improvement		Normal Skin
	No. Injct.	Units			
1	2	60,000	after 2 weeks		after 4 weeks
2	4	100,000	after 2 weeks		after 6 weeks
3	3	80,000	after 2½ weeks		after 5 weeks
4	3	80,000	after 2½ weeks		after 6 weeks
5	3	80,000	after 3 weeks		after 5 weeks
6	3	80,000	after 3 weeks		after 5½ weeks
7	3	80,000	after 3½ weeks		after 5½ weeks
8	4	100,000	after 5 weeks		after 7 weeks
9	4	100,000	after 6½ weeks		after 10 weeks
10	3	80,000	after 2 weeks		after 3 weeks
11	3	80,000	after 2½ weeks		after 4 weeks

Cases No. 10 and 11 had only dry skin.

min A per cubic centimeter.** It was given deep intramuscularly and was tolerated without any pain or ill reactions. The first dosage was 40,000 units and then 20,000 units were given daily for six days and thereafter 20,000 units three times a week. The results are outlined in table III.

After the skin manifestations disappeared the injections were stopped and fish liver oil (Burbot), 60,000 units per mouth daily were given for two to three weeks more.



Fig. 1. Case No. 9 (tables II and III). Before treatment. Note the severe follicular hyperkeratosis around the knee.

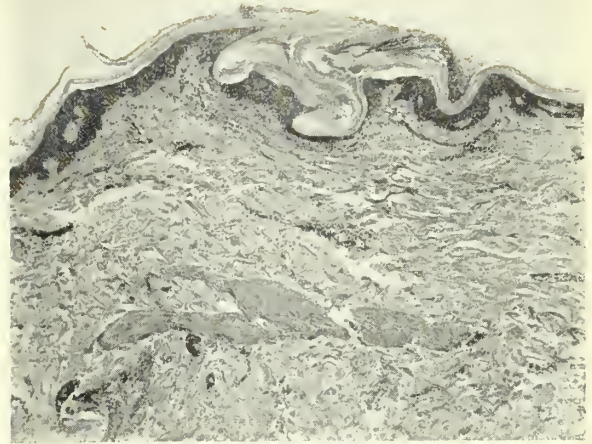


Fig. 2. Photomicrograph of a section from case 9 (tables II and III). Note the follicular plugging.

DISCUSSION

Without entering into the argument as to the etiology of the different forms of hyperkeratosis, one is, I think with our present knowledge justified to term those skin manifestations as an avitaminosis A, only where night blindness is present at the same time. Dryness of the skin, generalized pruritus and follicular hyperkeratosis may be signs of avitaminosis A and can be of value in diagnosis, especially where the presence of night blindness can not be ascertained (as in infants, etc.) which has been pointed out by Frazier and Hu¹¹ and Mackay.³⁵ There were a number of patients in whom the above mentioned skin manifestations were present but who had normal photometric readings. In spite of that fact, vitamin A was given to them for a period up to six months without the slightest changes of their skin lesions. Even assuming that a more precise instrument would have detected hemeralopia, these patients certainly would have shown some improvement if their lesions had been on an avitaminosis basis.

The value of the intramuscular administration compared to the oral, lies in the quick and prompt action and the certainty of absorption and utilization. All the obvious risks of the gastrointestinal tract upsets are avoided. The skin can be restored to normal in approximately half the time required with the oral administration as judged from the reports of Jeghers and others.

SUMMARY AND CONCLUSIONS

One hundred and fifteen patients who came to the clinic for various reasons but complained or showed at the same time generalized pruritus, dryness of the skin or follicular hyperkeratosis, were examined for vitamin A deficiency.

Subnormal photometric readings were found in 11 patients.

After injection of Burbot liver oil intramuscularly, normal skin condition was obtained between four and ten weeks.

Only cases showing both skin changes and subnormal photometric readings were considered as evidences of vitamin A deficiency.

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That after-care following sanatorium discharge prevents relapses and saves the lives of tuberculosis patients is reported by Kathryn Radebaugh Pearce, executive secretary of the Hennepin County Tuberculosis Association, in a study based on the 12-year record of residents at Sarahurst, boarding home maintained at 1827 Portland Avenue, Minneapolis, by the Association as a home for discharged tuberculosis patients.

Study of the 141 persons who have lived at the home periods of from three months to three years, shows that only 3 per cent have died since discharge, as compared with the recent figure for discharged patients in general, of 30 per cent dead five years after leaving the sanatorium. Only ten years ago, 50 per cent of tuberculosis patients were dead five years after discharge.

Sarahurst, with its program of home care for patients during their period of retraining, is a unique institution, the only one giving this type of care in the United States.

Mrs. Pearce's study will shortly be published in the official record of the recent annual meeting of the National Tuberculosis Association. Its title is: "Rehabilitating the Tuberculous in Hennepin County."

Appendicitis--A Hazard of Youth*

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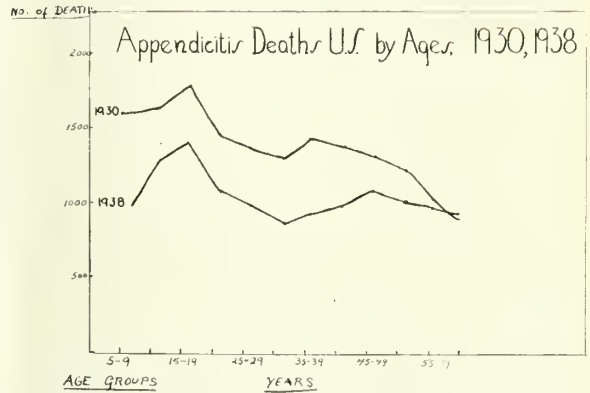
BOTH in title and position on the program, I am constituting the appendix of these otherwise very healthy meetings. I trust that your natural impulse to advise immediate removal may be delayed in this instance until the case history has been covered!

All of you who are gathered here are interested in preventive medicine, in a public health approach to disease. This implies the prevention of disease rather than its cure, but you must bear in mind that it is deeply concerned with the prevention of death. Surely appendicitis, in causing more than 16,000 deaths annually in the United States, must be classed as a public health problem. Perhaps its incidence cannot be lessened, but its mortality can be and should be lowered. The field of public health education is concerned here.

Historically, appendicitis did not assume prominence until the advent of modern surgery. But Hippocrates, as far back as 400 B. C. knew that laxatives might be dangerous for the relief of abdominal pain, because he warned against using them: "In Sharpe disease and in their Beginning, we ought seldom to use a purging medicine." Mestivier in 1759 was probably the first to describe and direct attention to an acute inflammatory lesion of the appendix. Parkinson in 1812 found at autopsy a perforation of the appendix in a young child, which he regarded as the cause of a fatal peritonitis. In 1827 Melier described five cases. He also stated that if the disease were regarded as rare it was because autopsies were incomplete. In the not too distant past, there must have been many cases called "acute indigestion" and "inflammation of the bowels" which were really appendicitis.

In this paper we shall proceed from the particular to the general, first discussing appendicitis as a college problem. We shall find a low mortality here and shall have to turn to the community rather than the college to account for its high death rate. We shall give the results of some college questionnaires, some general reports, and some particular studies made in Philadelphia and New York City. Finally, the role of the college in educating the public will be stressed.

Why is a study of appendicitis pertinent to a college group? Because the peak of its mortality comes between the ages of 15 and 19 years, with a high rate also between 20 and 24 years. You may be surprised to learn that it has maintained its place as the sixth cause of death between the ages of 15 and 24 years for a number of years. For the years 1930, 1935, and 1938, we find that if all external accidents are grouped, accidents assume first place, tuberculosis second, with pneumonia, heart disease and diseases of pregnancy varying in the third, fourth and fifth positions. In each of these years,



Graph I.

TABLE I.
Appendicitis Deaths by Age Groups

1930		1938	
Age Group	No. Deaths	Age Group	No. Deaths
Under 5	885	Under 5	696
5-9 yrs.	1,520	5-9	954
10-14	1,543	10-14	1,237
15-19	1,696	15-19	1,344
20-24	1,425	20-24	1,030
25-29	1,290	25-29	934
30-34	1,237	30-34	823
35-39	1,347	35-39	895
40-44	1,281	40-44	949
45-49	1,245	45-49	1,069
50-54	1,181	50-54	985
55-59	949	55-59	972
60-64	833	60-64	850

"Mortality Statistics, 1930," Washington, 1934, 31st Annual Report, U. S. Dept. of Commerce, Bureau of the Census, p. 248, table 7.

"Vital Statistics," Special Reports, vol. 9, No. 51, "Deaths from Each Cause," Dept. of Commerce, Bureau of the Census, Washington, June 20, 1940, p. 648.

however, appendicitis is found in sixth place as the cause of deaths between 15 and 24 years.

We should naturally expect, then, to find a high death rate from appendicitis among college students because of their age group. To find out if this were true, we sent questionnaires to some 43 colleges and universities, chosen to give a fairly representative sampling. We asked for the number of cases of appendicitis, the number operated upon at college, the number of deaths, together with preoperative blood counts and postoperative pathology.

The data for a five-year period from 22 colleges and universities, covering 286,134 students, showed a total of 3,032 cases of appendicitis with only six deaths, giving the remarkably low death rate of 2.1 per 100,000 as compared with the U. S. death rate of 12.25 among the group aged 15 to 24 years for the year 1938. Of

*Presented at the twenty-first annual meeting of the American Student Health Association at the University of Michigan, Ann Arbor, December 27-28, 1940.

†Connecticut College.

TABLE II.

Appendicitis in Colleges	1935-1936	1936-1937	1937-1938	1938-1939	1939-1940	Totals
Total number colleges included in survey	14	17	21	22	21	
Total number students enrolled	46,466	54,848	59,902	64,586	60,332	286,134
Total number cases of appendicitis	477	605	670	712	568	3,032
Total number appendectomies at colleges	277	390	391	447	340	1,845
Percent operated upon at colleges	58.1%	64.5%	58.4%	62.8%	59.9%	58.8%
Total number deaths	1	1	1	2	1	6
Death Rate per 100,000	2.15	1.82	1.67	3.10	1.66	2.10

(See graph of college appendectomies: Graph II.)

these college deaths, one was complicated by a kidney infection, and another by extreme obesity. The remaining four were unexplained. Of the total number of cases of appendicitis in the returns, 58.8 per cent were operated upon at college.

As mentioned above, we requested the preoperative white and differential blood counts and pathological reports on operated cases. Only seven of our series reported blood counts, the range of count being from 4,200 to 32,000. Of the cases reported upon, 72 were under 10,000 and 298, or 80 per cent, were above 10,000. The ten-year report of the University of Minnesota showed 85 per cent with a leucocytosis of 12,000 to 18,000. The following is a list of the institutions in our series submitting information on blood counts with their figures:

It is important to know whether or not the diagnosis of appendicitis is borne out by the operative findings. Strangely enough, only five colleges which replied to the questionnaire were able to give this information:

Dartmouth, Mount Holyoke, University of Kansas, University of Minnesota, and Connecticut. In these, the preoperative diagnosis was borne out in all cases by the pathological laboratory. The University of Minnesota groups its cases into two divisions—those showing interval appendicitis, and those showing acute appendicitis. Of the former, 56 per cent showed evidence of previous disease of the appendix. Of the latter, 85 per cent bore out the preoperative diagnoses. Since the number of appendectomies performed in any one institution is not great, the recommendation is made that college health departments keep records of these important findings as they occur, so that the data can be shown annually.

Perhaps this is the proper place to call the attention of the members of the Association to the unusually fine report of the University of Minnesota on appendicitis over a ten-year period from 1929 to 1939. The figures have not been included in our analysis because they are

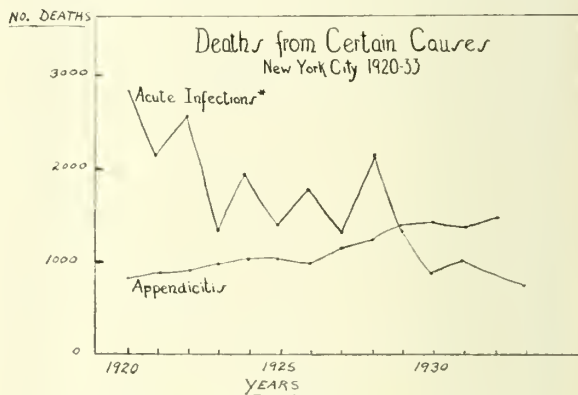
APPENDECTOMIES at COLLEGE

1938-1939

Berea	_____	N.J.C. for Wom.	_____
Calif., Uof	_____	Oberlin	_____
Conn.	_____	Princeton	_____
Dartmouth	_____	Smith	_____
Goucher	_____	Wellesley	o
Harvard	_____	Wesleyan	_____
Haverford	_____	William + Mary	_____
Jeff. Med.	_____	Williams	_____
Kansas, U.	_____	Wom. Col., U.N.C.	_____
Kent State	_____	Yale	_____
Mt. Holyoke	_____		

Rate per 100. Students .50 1.0 1.5 2.0 .00 .50 1.0 1.5 2.0

Graph II.



* Measles, Diphtheria, Whooping Cough, Typhoid, Scarlet Fever, Epidemic Meningitis.

Graph III.

TABLE III.

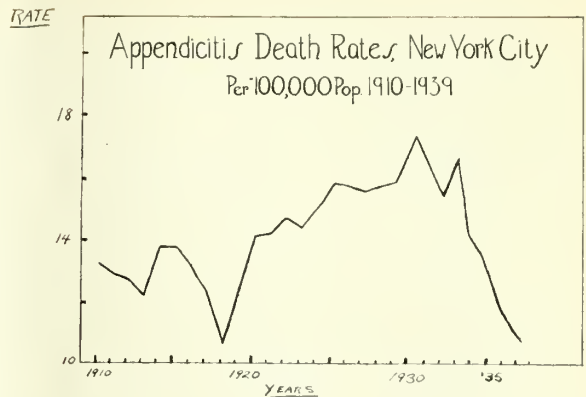
College	Range of Blood Count	No. Under 10,000	No. Over 10,000
Berea	4,200 to 32,000	16	66
Connecticut	5,300 to 28,000	10	27
Dartmouth	6,500 to 27,350	12	45
Kansas, University of	6,150 to 29,950	18	105
Mount Holyoke	11,650 to 18,000	0	11
Wesleyan	7,500 to 31,750	14	28
William and Mary	5,600 to 22,100	2	16

in summary form for the ten years, and ours cover five years. Their survey was published in April, 1940. The series comprise 594 cases with a mortality of zero. The report also lists a total of 1,006 cases from the Student Health Services of Purdue, Michigan, Pennsylvania, Yale, Cornell, and Duke, among which there were only four deaths. Schmidt and Joachim, of the University of Wisconsin, have reported a series of cases from the Wisconsin General Hospital in which they contrasted the Student Health Service cases and the General Hospital cases. The same surgical staff was responsible for the care of these two groups, and it is interesting to note that whereas among 615 student infirmary cases there were no deaths, among 688 of the General Hospital cases there was a gross mortality of 5.68 per cent.

The Minnesota survey concludes from its lack of fatality that operative fatality in early appendicitis is negligible, while the mortality of appendiceal abscess is at least 5 per cent and the fatality of generalized peritonitis at least 20 per cent. Should we delay in operating upon cases in which the clinical picture is not entirely conclusive? As one surgeon has said, "If we are to reduce the mortality in acute appendicitis, we must operate on more cases of appendicitis." Or, according to Dr. C. Gordon Heyd, former president of the American Medical Association, "In no other intra-abdominal condition are errors in commission so beneficial as in the removal of an appendix." Not long ago we had an amusing conversation with the father of one of our Connecticut College students. He is a surgeon from the midwest. He rushed in to see us and asked excitedly, "What do you do about appendicitis?" We told him that we urged operation as soon as the diagnosis was made. "Well," said he, "if my daughter even *thinks* she has appendicitis, don't wait to call me up—go ahead and operate."

Dean Lewis, of Johns Hopkins, in his review of appendicitis, stresses enteroliths as factors in etiology, principally in the secondary and recurrent types. Statistics show that they are present in the appendix in a relatively large proportion of the secondary and recurrent attacks. In many such cases, the disturbance is at first purely mechanical, and some of these do not show a high blood count. Bacteriological examination suggests that whereas colon bacilli occur more frequently in the appendices of older patients, streptococci are found generally in children and young adults. On several occasions at Connecticut College, we have had three or four cases of acute appendicitis occurring within a span of a few days, at a time when streptococcal throat infections were prevalent, suggesting the predilection which some streptococci have for the appendix. Fortunately the two conditions have never been present in the same individual.

Dean Lewis classifies appendicitis pathologically as *simple* or *catarrhal*, which predisposes to subsequent attacks, and *acute diffuse*. The suppurative and gangrenous processes are caused by virulent organisms. The leucocyte count should be considered confirmatory of the clinical findings, but should never take precedence



Graph IV.

TABLE IV.
Deaths from Appendicitis and Other Surgical Conditions
U. S. 1936

No. of Deaths	Causes
27,241	Cancer of Stomach and Duodenum
16,480	APPENDICITIS
16,280	Cancer of Uterus
15,364	Cancer of Intestines (except rectum and anus)
13,708	Cancer of Breast
13,433	Hernia and Intestinal Obstruction
12,182	Diseases of Pregnancy, Childbirth, etc.
11,811	Peptic Ulcer, Other Diseases of Stomach (except cancer)
9,623	Diseases of Gallbladder, Biliary Passages, Pancreas
7,325	Cancer of Rectum and Anus
4,569	Diseases of Thyroid and Parathyroid Glands
3,177	Cancer, Osteomyelitis and Other Diseases of Bones

U. S. Bureau of the Census, Vital Statistics Report, vol. 5, No. 41

over them. In some exceptionally severe infections which cause gangrene and a spreading peritonitis, there may be no leucocytosis because of a reduction in the defense mechanism.

The low college death rate indicates that our health programs are constructive. Considered in the light of the high mortality among this age-group in general, how can we account for the almost negligible death rate in colleges? We might attribute this beneficent result to a higher native intelligence and greater material advantages, except that Cecil, of Cornell Medical, finds the distribution to be general, without regard to economic level.

As for the disease itself, it is more common among men than among women, and most common between the ages of 10 and 30 years. Some of the predisposing factors are:

1. Stagnation of the intestinal contents in the appendix, resulting in the formation of hard concretions which may set up an inflammation.
2. Habits of life, particularly dietary, involving excessive food consumption, or an over-indulgence in certain types of food, especially low-residue "pap" foods.
3. The increasing and indiscriminate use of laxatives and cathartics.

4. Inadequate physical exercise and a sedentary life.

Since appendicitis is a surgical disease as soon as its diagnosis has been made, it is interesting to compare it with other important surgical conditions, to find its relative importance here. We have frequently heard that appendectomies comprise about three-fourths of all abdominal operations, so there is little doubt as to its frequency. Dr. Shepard Krech, of the surgical staff of Bellevue Hospital, New York City, made a national survey as well as one in New York City. He emphasizes the fact that appendicitis remains a leading cause of surgically preventable deaths, and his dramatic graphs bear this out. They show deaths from certain causes in the United States in 1936—causes for which surgery is brought into play. It is illuminating to find that appendicitis deaths are second in the list, as the accompanying table shows. (See table IV.)

As might be expected, cancer of the stomach is far in the lead. As Dr. Krech writes, "It is a silent, insidious disease; the patient is often in a debilitated condition; the pathology may have progressed beyond the borderline of operability; operation is lengthy, extensive and hazardous at best." But appendicitis has no such alibi. It strikes down the young healthy adult. Except for very unusual cases, it should be easily recognized by the physician. An uncomplicated appendectomy is easily performed, has a very low mortality, and when taken in hand early, the pathology is entirely eradicated. Considering these facts, it is appalling to know that it remains such a baffling problem as a leading cause of surgically preventable deaths.

Since we have learned what a fearful toll this disease exacts in the general population, upon what factors does the low college rate depend? It must be that college cases report earlier for diagnosis and treatment, before "home remedies" have been tried, such as that favorite laxative or cathartic. Dare we hope that Hygiene lectures have borne fruit? We must pay tribute, also, to a certain group solidarity, a concern felt when one member of the college group is not well. Friends are afraid to assume too heavy a responsibility, and they tend to rush the patient off to the infirmary or health office for a medical consultation.

If the college group does not contribute to this high death rate, where shall we look for these deaths? Young industrial workers? To find out, we sent questionnaires to a number of industrial concerns, but were unable to extract much information. Even the American Telephone and Telegraph Company with its excellent medical department was unable to give any statistics on the subject. The Henry Ford Hospital, Detroit, did send their figures for the number of cases of acute appendicitis and number of deaths among these for the past five years. Among 1,085 cases, there were 21 deaths, or 1.9 per cent. Colleges and boarding schools are in a class by themselves in the possibility of furnishing a controlled environment.

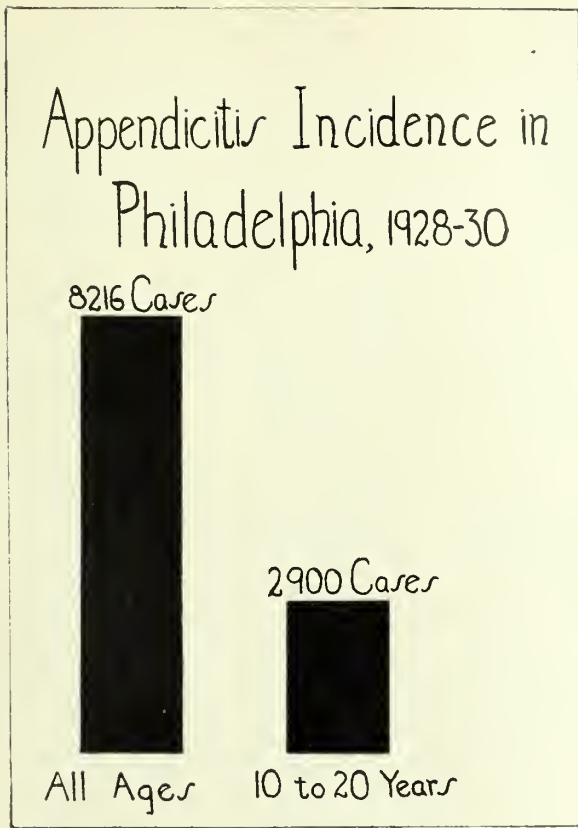
In our search we next turned to detailed reports of vital statistics for the United States to find out if there were a factor of geographical distribution.

TABLE V.
Appendicitis Death Rates by States, 1936

Rank Order		Alphabetical Order	
28.55	Nevada	13.67	Alabama
22.14	Montana	19.51	Arizona
20.56	Colorado	12.56	Arkansas
20.08	Utah	14.11	California
19.51	Arizona	20.56	Colorado
19.06	Wyoming	9.33	Connecticut
18.63	Vermont	10.07	Delaware
18.49	District of Columbia	18.49	District of Columbia
18.20	Idaho	14.24	Florida
16.77	New Mexico	10.45	Georgia
16.35	Iowa	18.20	Idaho
16.16	North Dakota	13.83	Illinois
15.61	Oklahoma	13.28	Indiana
15.42	Kansas	16.35	Iowa
15.23	Louisiana	15.42	Kansas
15.05	New York	12.39	Kentucky
14.84	Washington	15.23	Louisiana
14.82	Missouri	13.54	Maine
14.44	Texas	9.50	Maryland
14.44	Michigan	12.26	Massachusetts
14.24	Florida	14.44	Michigan
14.11	California	12.71	Minnesota
13.83	Illinois	11.49	Mississippi
13.67	Alabama	14.82	Missouri
13.64	Nebraska	22.14	Montana
13.54	Maine	13.64	Nebraska
13.53	Rhode Island	28.55	Nevada
13.48	Ohio	12.25	New Hampshire
13.28	Indiana	12.92	New Jersey
13.03	Tennessee	16.77	New Mexico
12.96	Wisconsin	15.05	New York
12.92	New Jersey	9.84	North Carolina
12.71	Minnesota	16.16	North Dakota
12.56	Arkansas	13.48	Ohio
12.39	Kentucky	15.61	Oklahoma
12.26	Massachusetts	11.11	Oregon
12.25	New Hampshire	11.40	Pennsylvania
11.55	South Dakota	13.53	Rhode Island
11.49	Mississippi	8.97	South Carolina
11.45	West Virginia	11.55	South Dakota
11.40	Pennsylvania	13.03	Tennessee
11.11	Oregon	14.44	Texas
10.82	Virginia	20.08	Utah
10.45	Georgia	18.63	Vermont
10.07	Delaware	10.82	Virginia
9.84	North Carolina	14.84	Washington
9.50	Maryland	11.45	West Virginia
9.33	Connecticut	12.96	Wisconsin
8.97	South Carolina	19.06	Wyoming

(Computed from U. S. Bureau of Census figures.)

Although a great deal has been said about deaths in sparsely settled rural areas because of a dearth of proper hospital facilities, a study of the United States deaths for the year 1930 shows that the mortality rate for appendicitis was twice as high for urban as for rural areas. On the other hand, the blackest spot in death rate from this cause in 1936 was made up of a group of sparsely settled states with poor hospital facilities; namely, Nevada in the lead with a death rate of 28.5; Montana, 22.1; Colorado, 20.5; Utah, 20.0; Arizona, 19.5; and Wyoming, 19.0. Most of these are states in which mining is an important occupation. Communities are small, without advantages, and standards of living low. At the other end of the list we find North Carolina with a rate of 9.8; Maryland, 9.5; Connecticut, 9.2;



Graph V.

and South Carolina, 8.9. Three of these states have a high negro population, and mortality statistics show that the negro death rate is not very different from that of the whites. We cannot even assume that warm climate is a factor in bringing about a low appendicitis death rate, because Connecticut was next to the lowest, and California and Florida both show a rate of 14. Speculation seems useless. (See table V.)

What are some of the factors involved? Why is it that an operable condition is not handled satisfactorily in our cities? In large industrial centers, a variety of problems exist. The population is heterogeneous; many people still dread hospitalization because of ignorance. The interruption of earning power is an important economic factor. Hurried living, bad food habits, constipation, with the too frequent resort to laxatives and cathartics may be factors particularly in city life. Finally, the medical profession must share the blame.

Cities show the same puzzling diversity in appendicitis death rates that is found in the states. A listing of 26 cities of over 300,000 population in 1931 gives Houston, Texas, a rate of 7.4, and Kansas City, Missouri, 28.6. The seven other cities with a death rate of 20 or over were Newark, N. J.; Buffalo, N. Y.; Minneapolis, Minn.; Boston, Mass.; New Orleans, La.; and Cincinnati, Ohio, all widely separated from each other and showing no other kinship. New Orleans inaugurated an educational campaign, and its rate declined from 25, in 1931, to 18.6 in 1936.

TABLE VI.
Deaths from Appendicitis and Other Acute Infections
New York City, 1920-1933

Year	APPENDICITIS	SIX ACUTE INFECTIONS:
		Measles, Diphtheria, Whooping Cough, Typhoid Fever, Scarlet Fever, Epidemic Meningitis
1920	792	2876
1921	824	2061
1922	883	2573
1923	887	1324
1924	946	1970
1925	1022	1468
1926	1022	1706
1927	1018	1333
1928	1043	2031
1929	1071	1280
1930	1111	863
1931	1157	902
1932	1065	725
1933	1149	629

Krech, Shepard, M.D., The Problem of Acute Appendicitis in New York City, reprint from New York State Journal of Medicine 35:6, (March 15) 1935.

TABLE VII.
Appendicitis Death Rates per 100,000 Population,
New York City 1910 to 1939

Year	Rate	Year	Rate
1910	13.4	1925	16.2
1911	13.0	1926	15.8
1912	12.8	1927	15.5
1913	12.2	1928	15.6
1914	13.8	1929	15.7
1915	13.8	1930	16.0
1916	13.1	1931	16.5
1917	12.4	1932	15.0
1918	10.6	1933	16.0
1919	12.4	1934	13.9
1920	13.9	1935	12.6
1921	14.2	1936	14.2
1922	14.9	1937	12.6
1923	14.6	1938	11.0
1924	15.3	1939	10.6

From Summary of Vital Statistics, Department of Health, City of New York, Bureau of Records—Statistical Division, p. 6.

To mention findings in another specific study, Dr. Krech's report of appendicitis in New York City states that among the medical profession there is too little realization of its seriousness. When we hear that the operative mortality of acute appendicitis in fourteen representative New York hospitals was 7 per cent in 1921, and only one-tenth of one per cent less in 1931, we may agree that the problem has not been entirely solved.

The accompanying chart brings out the contrast between the conquest of some of the acute infections of childhood and the lack of control over appendicitis mortality. The period covered is from 1920-1933, and the six infectious diseases included are measles, diphtheria, whooping cough, typhoid, scarlet fever, and epidemic meningitis. (See table VI, graph III, Appendicitis and Acute Diseases.)

Since 1933, however, there has been an encouraging drop in mortality in New York City, following con-

certed efforts to lessen this scourge. (See table VII, graph IV, Appendicitis Death Rate in New York City.)

In looking over the field, we found that the most complete campaign to lower appendicitis death rates has been made by Dr. John G. Bower, one of the surgeons of the Philadelphia General Hospital under the auspices of the Department of Public Health of that city. His work involved both a study of the existing facts and the formulation of a few simple public health rules. His crusade gave impetus to other cities to try to reduce their death rates, and New York, New Orleans, and Cincinnati have made subsequent studies. Because of the public health significance of this study, we shall tell a few details of the "Philadelphia story." The hospital survey brought out the importance of early operation, since only one death in 39 occurred among patients who had been operated upon within 24 hours; while one-ninth of the deaths were among those who had waited over 72 hours. It also emphasized the danger of laxatives since a high percentage of the deaths from peritonitis occurred among those who had had laxatives.

In diagnosing appendicitis, Dr. Bower's cases showed only one symptom always present—pain; only one sign uniformly present—tenderness (absent in 11 per cent); only one corroborative test—leucocyte count (absent in 20 per cent).

The appendicitis mortality percentage dropped in Philadelphia from 5.97 per cent in 1929, to 3.44 per cent in 1932. Dr. Bower attributed the reduction to the intensive educational campaign, among the doctors as well as the public, and lists the following six factors:

1. A marked increase in the number of cases over preceding years.
2. Earlier hospitalization.
3. Diminished number of cases of peritonitis.
4. Diminished number of cases of spreading peritonitis.
5. Improvement in the management of spreading peritonitis by the surgeons of Philadelphia.
6. Less frequent administration of laxatives.

In conclusion, after a five years' campaign in Philadelphia, Dr. Bower stresses education in the high schools. Of the patients operated upon, 35.3 per cent were between the ages of 10 and 20 years. (See graph V on Dr. Bower's work.) Assembly health talks have been

inaugurated, to tell students of the significance of abdominal pain — that it is not usually due to something they have eaten, but a warning that something is wrong; they are told not to take anything by mouth, especially a laxative, and that they should call their family doctor immediately. Each year a day is set aside as "Appendicitis Day" by the Board of Education, with a suitable program. Each student is given a warning sticker to affix to the cover of one of his books, to be taken home and shown to family and friends.

If similar efforts were made throughout the country, some 9600 lives might be saved annually in the United States, as shown by the chart. The total death rates have not altered materially for the 15 to 24 year age group or for the total population between 1930 and 1938. Since this is so, greater effort should be made to reduce this mortality, and education of the youth group is of great importance. We must not forget that appendicitis is a public health problem comparable to tuberculosis. As yet, too little concerted effort has been made in this direction. It seems decidedly worthwhile for our organization to realize its responsibility in personal and classroom teaching to this end. Dr. Sundwall has suggested that members of our organization should spread their influence beyond the college walls to the community. Here is a challenge to spread an appendicitis message to the young in secondary schools. Our students if properly impressed will return to their communities to pass on the message of careful treatment of the old-fashioned "bellyache". They will have children of their own, and we trust will remember later important dicta received in their college courses. As an organization, let us incite a fight against appendicitis.

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MEDICINE AND THE NEWER PHYSICS

To those who imagined that the availability of numerous artificially produced radioactive elements would speedily result in the development of new and better methods for the cure of disease, the history of the application of physics to medicine during the last few years has been a great disappointment. There has been no startlingly successful application of artificially radioactive materials to the therapeutic side of medicine. But to say so is not to suggest that the new techniques have not contributed significantly to medicine already, and do not give promise of yielding even more valuable fruits.

By the use of isotopes, the chemically identical siblings of elements, which differ from the ordinary forms of elements only in mass and in life expectancy, it is possible to trace what happens to many chemical substances in the body. For example one can administer to an

animal small amounts of carbon dioxide in which some of the carbon present is in the radioactive form with atomic weight eleven, as compared with the most abundant and usual atomic weight twelve, and then ascertain what actually happens to that carbon dioxide during its stay in the body by tracing the fate of the radioactive C₁₁. For practical reasons the carbon dioxide is administered as sodium bicarbonate solution intravenously. It might have been imagined that the carbon dioxide containing C₁₁ would be quickly blown off in the lungs, but by no means all of it is. A significant portion of it remains in the body and is found in the liver glycogen, and elsewhere. This does not mean, of course, that the mammalian body can synthesize carbohydrate from carbon dioxide and water in the way plants do. It does mean, however, that at least at some stage in the metabolism of carbohydrate a reversal of the usual oxidation process can occur and that carbon dioxide can be incorporated

into some carbohydrate intermediate compound. This revolutionary conclusion could not have been arrived at by the use of any other methods of investigation now known. So, too, nitrogen isotopes have been used to study the metabolism of proteins, their component amino acids and other nitrogenous compounds. It has been found that there is a rapid turnover of these compounds in the body.

These observations and others like them have demonstrated that many chemical compounds which we once looked upon as relatively stable and fixed are actually undergoing continuous degradation and replacement. We have also learned that the mineral components of bones and teeth are not deposited once and for all, but that they are continually exchanging with the same minerals in the blood and other tissues.

The most important result to date of investigations with isotopic tracers is the proof that the living body is, even in its supposedly permanent structure, in a state of what may be called dynamic equilibrium. Absolutely nothing material in the body is laid down to stay for a lifetime. Only the patterns of structure and not the structures themselves are fixed. The materials that fit the pattern are all shifted about from place to place at different rates in different structures. We are being forced more firmly to the view of life as a state of chemical and physical balance, delicately maintained by opposing forces and processes, the control of which is the peculiar and marvelous property of living systems.

Medicine has already been advanced, and will profit immensely more from the new knowledge about the more intimate nature of life processes which the tools and fruits of modern physics have made accessible to investigators. The isotopes of the elements may not in themselves be extremely useful medical agents, although it is of course too early to say that they will not, but in any case they are powerful weapons in the hands of the investigators who will uncover the basic knowledge on which advances in clinical medicine are being and will continue to be founded.

M. B. V.

MEETING OF INTER-STATE POST GRADUATE MEDICAL ASSOCIATION

We were so impressed by the success of the 26th International Assembly of the Inter-State Post Graduate Medical Association held in Minneapolis last month that we feel a short expression at this time is in order. Dr. Frank H. Lahey of Boston, President of the American Medical Association, stated unhesitatingly at the banquet that the Inter-State Post Graduate Medical Association was the greatest contributor to post graduate medical education in the world today. If there ever has been any fear on the part of members of the profession that this latter association might be detrimental to the American Medical Association, it is dissipated by the continued large attendance at both and by the manner in which presidents and ex-presidents of the American Medical Association have contributed to its success. The Inter-State Post Graduate Medical Association does not

usurp any of the functions of the American Medical Association; rather it serves to augment its educational features by supplying an intensified refresher course that appeals to the entire profession.

Dr. Roscoe R. Graham of Toronto, Canada, President of the Assembly, made a favorable impression in his diagnostic clinic at the Wednesday forenoon session in the municipal auditorium. His remarks were practical and understandable, best illustrated perhaps by his lucid comparison of the mortality statistics of bleeding ulcer and gastrectomy. He suggested that the individual operator, knowing the mortality rate in his own work, might in such cases use that as a guide in his choice of treatment. At the assembly dinner, the subject of Dr. Graham's address was "This Changing World."

Dr. Arthur G. Sullivan of Madison, Wisconsin, is the worthy successor of the late Dr. Peck as managing director. The Association is fortunate in having the services of this gentlemanly administrator available at this time. We predict continued success under his guidance.

A. E. H.

THE FLYING DOCTOR

In recent years large numbers of physicians have begun to travel by airplane. They are often criticized on the basis of alleged danger of accidents. Many physicians do not fly because they, themselves, or members of their families are convinced that there is great hazard in this method of transportation.

In reality, flying with the standard commercial airlines has become one of the safest methods of travel. For example, in 1939 scheduled air transport planes flew 749,787,000 passenger miles with only two fatal accidents, resulting in the death of nine passengers. During 1939 for every 100,000,000 passenger miles flown there was a death rate of only 1.2. Prior to August 31, 1940, the commercial airlines operating within the continental limits of the United States flew seventeen months and five days without fatal injury to passengers or crew. During this period 136,367,473 plane miles were flown and approximately 3,281,661 passengers flew 1,361,889,362 passenger miles. At that time the air lines were under the Civil Aeronautics Authority, which functioned independently of government departments, with a separate safety board. However, arrangements were made for a new Board to function largely under the Commerce Department, with a Safety Bureau composed of its own members. An administrator from the Commerce Department was supposed to do the work but was not a member of the Board. In the first seven months of this new Board's activities there were five crashes, killing forty passengers and fourteen crew members. The passengers included one senator and one congressman; others who were severely injured included Eddie Rickenbacker, World War ace, and now President of the Eastern Airlines. Our air lines are capable of functioning with almost no mortality among passengers or crews and it is extremely unfortunate that there should ever be any tampering with them through changes

in governmental administration. Aside from two or three brief periods when apparent inefficiency was permitted in the supervisory offices, or poor judgment was manifested by those in control, there has been marked improvement in safety of air travel on the regular scheduled air lines. Improvement of equipment, better training of pilots, good lighting systems, better landing fields, radio beams, etc., have made air travel on scheduled commercial lines extremely safe, in fact, second only to railroads. Of the accidents which occur, 35 per cent are charged to errors made by personnel, 30 per cent to failure of motor or defects in other parts of the plane,

15 per cent to weather conditions, and 20 per cent to all other factors.

The flying of private planes is far more hazardous. Persons operating their own planes for pleasure, taking passengers on sight-seeing excursions, and teaching others to fly, had a death rate among themselves and their passengers of 85.7 per 100,000,000 miles in 1939.

The National Safety Council, 20 North Wacker Drive, Chicago, has available at all times last-minute information concerning the safety of airplane travel.

J. A. M.

Book Reviews

A Textbook of Pathology, edited by E. T. BELL, Professor of Pathology, University of Minnesota, Minneapolis; fourth edition, enlarged and thoroughly revised, illustrated with 431 engravings and two color plates. Philadelphia: Lea & Febiger, 1941. Price \$9.50.

Dr. Bell's justly admired *Textbook of Pathology* has gone into its fourth edition. The greater part of the text of the third edition has been thoroughly revised and a large amount of new material has been introduced. Pathological physiology is discussed in connection with the majority of diseases in which well-established data are available. Importantly, recent medical literature has been thoroughly scanned and the text brought into accord with current medical thought. Nevertheless a conservative attitude has been adopted toward opinions that are at present not widely accepted.

This book has been prepared with the idea of furnishing the medical student a textbook that he may use during his clinical training. In addition to Dr. Bell, B. J. Clawson, M.D., Professor of Pathology at the University of Minnesota, and J. S. McCartney, M.D., Associate Professor, have assisted in the preparation of this volume. Greatest attention, of course, has been given to pathology of tumors, with neuropathology running a close second. The book is a valuable addition to the student's or the physician's library.

Jacksons' Cancer of the Larynx, by CHEVALIER JACKSON, M.D., honorary professor of broncho-esophagology, and CHEVALIER L. JACKSON, M.D., professor of broncho-esophagology, Temple University; octavo of 309 pages, with 239 illustrations. Philadelphia: W. B. Saunders Company, 1939. Price \$8.00.

Cancer of the Larynx is typical of all the writings of the Jacksons. It is interesting to read, illustrated with many original plates and drawings and gives the present opinion of the authors based on their extensive experience.

Due emphasis is placed on the need of earlier recognition of cancer of the larynx. Direct examination of the larynx is thoroughly described and its value is insisted upon in the determination of the proper treatment to be given each individual patient. No surgeon need explore a larynx to discover the extent of the lesion and then decide upon the type of operation. This should be done by direct laryngoscopy.

Laryngofissure is advised for all early cases of vocal cord cancer, even when the lesion involves both cords in the anterior commissure. Cutting through the growth is avoided by the Jackson technique of laryngofissure for cancer in this region. Seventy-nine per cent of 34 patients obtained a three year cure by this operation.

Laryngectomy is discussed, and this reviewer was disappointed not to find a description of Babcock's latest modification. Radiation therapy, pathological diagnosis, precancerous lesions, and all other phases of the subject are carefully considered.

The book is a good summary of the present day ideas on cancer of the larynx, with emphasis on the Jackson ideas. It should be read by everyone interested in the subject.

X-Ray Therapy of Chronic Arthritis (including the X-Ray Diagnosis of the Disease). Preliminary report based on 100 patients treated at Quincy, Illinois. By KARL GOLDHAMER, M.D., Associate Roentgenologist, St. Mary's Hospital and Quincy X-Ray and Radium Laboratories, Quincy. With a foreword by Harold Swanberg, B.S., M.D., F.A.C.P., Roentgenologist, St. Mary's Hospital and Blessing Hospital, Quincy; cloth; 131 pages, with 26 illustrations; Quincy: Radiologic Review Publishing Co., 1941. Price \$2.00.

The author feels that successful X-ray therapy of arthritis is dependent upon accurate roentgen diagnosis and therefore, about a third of the book is devoted to X-ray diagnosis, the first three chapters being concerned with: (1) clinical aspects and pathology; (2) roentgen findings in chronic arthritis; (3) roentgenologic differential diagnosis. This discussion concerns itself chiefly with features of atrophic and hypertrophic arthritis; it is concise and practical and contains helpful tables dividing the chief clinical and roentgenologic changes of these two types of arthritis. The illustrations are drawings made from several roentgenograms showing various changes and stages of the same type of arthritis. They are well done and are of more value than are reproductions of actual roentgenograms, probably especially so for the reader not accustomed to extensive film reading.

The last seven chapters consider historical aspects, mode of action of X-rays on arthritis, selection of cases, technique of treatment, report of patients and results. The report of patients is actually based on only 100 patients treated during a period of 21 months at Quincy, Illinois. The author's experience in fifteen years of practice in Vienna, however, is also a basis for this preliminary report. A more complete and final report is contemplated. The chapters on selection of patients and on technic are of especial interest to radiologists. The suggested dosage in terms of "r" units of a certain quality of radiation, the time interval, the contraindications as well as the dangers are clearly outlined and constitute a fairly definite basis upon which therapists can proceed in a uniform manner. This is probably the chief merit of this work. It will undoubtedly prove interesting and of value to those interested in the subject of arthritis and will tend to standardize this somewhat new and possibly not fully appreciated form of therapy.

Synopsis of Applied Pathological Chemistry, by JEROME E. ANDES, M.S., Ph.D., M.D., F.A.C.P., and A. G. EATON, B.S., M.A., Ph.D. St. Louis: The C. V. Mosby Co., 1941.

From the viewpoint of the technician, this chemistry makes a splendid supplement to the many handbooks available now. The concise, simple, yet easily accessible information concerning the diseases involved when running various chemistries is not only valuable in itself, but makes for more intelligent work. Both valuable and interesting are the compact tables giving the salient facts at a glance and the summaries coming at the ends of chapters or divisions.

REPORT OF THE
SOUTH DAKOTA DELEGATE TO THE 1941
AMERICAN MEDICAL ASSOCIATION MEETING

J. R. Westaby, M.D.
Madison, South Dakota

The ninety-second annual session of the American Medical Association was held in the Municipal Auditorium at Cleveland, Ohio, June 2-6, 1941. Seven thousand one hundred ninety-four physicians registered for the meeting while several thousand more attended a number of the lectures and exhibits.

The scientific exhibit was unusually instructive, some 172 exhibits being arranged, with attendants almost constantly present to give lectures or explain interesting points to the visitors.

The two large educational exhibits, subsidized by the American Medical Association ("Fractures and Lame Backs") were well and continuously attended. "Fractures of the Ankle" was another exhibit of unusual interest because of the display which led the visitor step by step through the diagnosis, treatment and care of the injured patient.

The Gold Medal Award in Group I "Original Investigation" went to Drs. A. L. Berman, F. S. Grodus and A. C. Ivy of Northwestern University Medical School for their demonstration of the "rationale of bile salt therapy." The Silver medal went to Drs. H. T. Hyman, W. Leifer and L. Chargin of New York on their "Massive-dose Treatment of Syphilis by the Intravenous Drip Method." The Bronze Medal went to Drs. W. M. Boothby, W. R. Lovelace, and C. W. Mayo of the Mayo Clinic for their showings of the "Physiologic Problems of Aviation."

In Group II "Excellence of Presentation", the Gold Medal was awarded to Drs. W. Walters, H. K. Gray and J. T. Priestly of the Mayo Clinic for the exhibit on "Cancer of the Stomach." The Silver Medal went to Drs. G. C. Penberthy and C. N. Weller for their splendid colored photographs illustrating the "Treatments of Burns."

Many moving picture machines were constantly in use showing new methods and procedure in every branch of medical and surgical practice.

Medical preparedness was the subject of many addresses and scientific presentations giving the attitude of organized medicine toward war problems. The chief speaker of this subject was Dr. Frank Howard Lahey, president-elect of the American Medical Association who called for full cooperation, medically and otherwise, in the gigantic task now confronting the Nation. Keeping the same theme in mind the retiring president, Dr. Nathan B. Van Etten, called upon the Association's full membership to assist in their own localities in combatting attacks upon the profession and the principles of medical practice.

The House of Delegates met Monday, Tuesday and Thursday and in a most business-like way attacked the many problems confronting it.

In Executive Session a resolution was approved urging the United States Government to plan and arrange immediately for the establishment of a central authority with representatives of the civilian medical profession to be known as the Procurement and Assignment Agency for Physicians of the Army, Navy and Public Health Service.

A resolution on Eligibility of Women Physicians and Surgeons for Medical Reserve Corps was given a full hearing and after considerable discussion it was pointed out that it was impractical, because it would make it necessary to reconsider the entire program of construction of Military Hospitals and would throw into confusion some of the existing procedures under which the medical defense program is developing.

Dr. Irvin Abell, chairman of the Committee on Medical Preparedness of the Association, declared that the strength of military and industrial effort can be enormously aided by the application of highly specialized scientific knowledge accumulated by the medical profession in relation both to prevention and to cure of disease. He pointed out the profession's responsibility included not only provision of service to armed forces but also to industry and care of the civilian population.

The survey of the American Medical Association has progressed well and of the 180,000 questionnaires sent out the majority have been returned, giving information needed to guide the assignment of medical men to military forces with the least possible interference with the needs of the civilian population and of those of essential medical institutions.

Medical students, interns and teaching personnel are now deferred from selective service system as long as such individuals give reasonable promise of becoming medical doctors or teaching members of medical schools, hospital staffs, or hold key medical positions in industry and in civilian life since their duties in these positions are indispensable in the National Defense Program.

A large group of physicians are serving as examiners for draft and selective service boards giving and being required to devote an undue amount of their time in such capacity without any compensation. Therefore alternate examiners have been appointed to relieve the load on the original appointed examiners.

A resolution was presented by Dr. Harvey B. Stone on Medical Examination of Draftees concerning uncompensated services rendered by physicians to the Selective Service and a recommendation from the reference committee advising against payment to physicians for this service because the American Medical Association has pledged its utmost service to the Government, in behalf of the National Defense Program. The resolution was disapproved.

A report of the Committee on Legislative Activities dealing with Veterans Hospitals, reaffirms the belief that no hospital should be created nor any present one expanded under the Veterans Administration Act unless there is proved need for such facility in the community and that need should be determined after consultation of the government representatives with the medical profession of the area of the proposed project.

In our own state of South Dakota Senator Gurney has introduced a bill asking that \$1,000,000 be appropriated to establish a South Dakota Veterans Hospital and diagnostic center in the First Congressional District.

Regarding the action of the District Court of the United States for the District of Columbia at Washington, D. C., in which the Grand Jury of said District found the American Medical Association and the Medical Society of the District of Columbia guilty fining them \$2,500 and \$1,500 respectively: The Board of Trustees recommended to the House of Delegates that Council for the American Medical Association be requested and directed to appeal the judgment based on the verdict of guilty against the American Medical Association in the case of United States vs. American Medical Association to the Supreme Court of the United States.

The vote was unanimous.

The House of Delegates selected Dr. Fred Wharton Rankin of Lexington, Kentucky, formerly of the Mayo Clinic, as President-elect of the American Medical Association and awarded the Distinguished Service Medal to the famous pathologist, Dr. James Ewing of New York, professor of Oncology, at Cornell University Medical School.

The meeting places for the next three years are as follows: 1942—Atlantic City, New Jersey; 1943—San Francisco, California; 1944—St. Louis, Missouri.

Secretary's Letter

SOUTH DAKOTA STATE MEDICAL ASSOCIATION

The Council met at noon on Monday, September 15, in the private dining room of the Marvin Hughitt Hotel in Huron, for luncheon with members of the Inter-Allied Council. A discussion of the advisability of holding joint and overlapping annual sessions next spring in Sioux Falls was discussed. It was decided to do so and that the Presidents and Secretaries of the several associations involved be the committee on arrangements.

Immediately following this meeting, the Council was called to order by the chairman, Dr. D. S. Baughman. The following members were present: Drs. B. M. Hart, J. C. Ohlmacher, C. E. Sherwood, J. L. Calene, H. R. Brown, D. S. Baughman, C. E. Robbins, G. E. Burman, W. E. Donahoe, E. M. Stansbury, R. E. Jernstrom, R. V. Overton, Wm. Duncan, J. R. Westaby, our delegate to the A. M. A., and Karl Goldsmith, our attorney.

The minutes of the previous meeting were approved as printed in the July issue of the *JOURNAL-LANCET* without reading.

It was moved by Dr. Stansbury, seconded by Dr. J. R. Westaby, that the president, president-elect and secretary of the association form the committee on arrangements for the annual session. Motion carried.

The committee recommended, upon the recommendation of the Seventh District hosts, that George Stevens be chosen as general chairman in charge of local arrangements. It was moved by Dr. Stansbury and seconded by Dr. Hart that his appointment be confirmed. Motion carried.

Dr. Hart, president, gave a short address relative to the aims of his administration.

Dr. J. R. Westaby's bill for expenses to the annual session of the A. M. A. at Cleveland was presented. Moved by Dr. Stansbury and seconded by Dr. Robbins, that it be allowed. Motion carried.

Report of our delegate to the annual session at Cleveland was presented. Following a discussion, it was moved by Dr. Hart and seconded by Dr. Stansbury that the report be accepted and published in the *JOURNAL-LANCET*.

Dr. Stansbury discussed the licensing of refugee physicians in the state. It was moved by Dr. Ohlmacher and seconded by Dr. Robbins that this matter be referred to the committee on Medical Licensure. Motion carried.

A report of Dr. Robbins on the workings of the experiment with Farm Security medical set-up in their district was given. He reported that the doctors, for the most part, were fairly well satisfied with the set-up and that for the limited service given, it seemed to be working out fairly well.

The secretary reported that Karl Goldsmith was willing to present at the district societies, a discussion of some phase of medical legal practice, if desired. The matter was discussed by Goldsmith and other members present. It was the consensus that this might be well worth while and arrangements will be made whereby the talk will be available.

Dr. Robbins moved that the \$50 assessment to the Inter-Allied Council be approved and the secretary be instructed to send the check to the Secretary, Geo. Keinholz. Seconded by Dr. Baughman. Motion carried.

Dr. Ohlmacher presented the matter of court reform which Dean McCusick is attempting to get through, whereby expert witnesses be appointed by the court and be available for both sides rather than having each side select an expert and bring

about conflicting testimony. Moved by Dr. Stansbury that the Council approve in principle, this reform. Seconded by Dr. Ohlmacher. Motion carried.

Dr. Duncan presented a resolution, suggesting that the limits on medical and hospital attendance for injured employees, coming within the scope of Workman's Compensation Act, be increased and suggested that the medical association contact local labor organizations and try to enlist their interest and aid in such a move. He also suggested that its scope be increased to cover casual labor such as neighbors helping out on exchange work, etc. No definite action was taken.

Meeting adjourned.

CLARENCE E. SHERWOOD, Secretary.

The Department of Gynecology and Obstetrics of the University of Iowa has written your secretary, suggesting that there would be available to men in the state, a six day period of special teaching in obstetrics and gynecology every other week beginning October 6 and lasting through to June. This course is limited to three or four practitioners each week and therefore should afford good individual study in obstetrical and gynecological problems. It is given without charge for instruction. Transportation and maintenance is taken care of by the physician himself. Further information can be secured by writing to Dr. A. W. Diddle, Department of Obstetrics and Gynecology, University of Iowa, University Hospitals, Iowa City, Iowa.

WOMAN'S AUXILIARY TO THE SOUTH DAKOTA STATE MEDICAL ASSOCIATION

The Huron District Auxiliary held their dinner October 24 at the Marvin Hughitt Hotel, Huron, South Dakota, and later adjourned to the home of Mrs. Shirley where election of officers and discussion of plans for the year's work were held.

The Seventh District Medical Auxiliary recently held a dinner in the dining room of the McKennan hospital with the Presentation Sisters as hostesses. Mrs. Anton Hydem presided and introduced Mrs. R. Regan who reported on the state convention held at Mitchell and Mrs. F. C. Nilsson on the national meeting at Cleveland, Ohio. Mrs. J. Berdahl told of the need for Red Cross work and the auxiliary announced plans to form a chapter. Motion pictures of a summer Caribbean cruise were shown by Mrs. Nilsson as a closing part of the program.

UTERINE FIBROIDS COMPLICATING PREGNANCY

Because of the high incidence of abortion and maternal morbidity and mortality associated with operative procedures on fibroids during pregnancy, most cases are best treated in a conservative manner. As a rule the acute symptoms associated with degeneration last only about two weeks and in most instances can be controlled without undue risk to the patient. In a series of 53 pregnancies complicated by fibroids, reported in *The Journal of the Michigan State Medical Society* for October, 1941, by J. Robert Willson, M.D., of Ann Arbor, Michigan, the incidence of operative deliveries because of the tumors was 22 per cent. With the exception of eight patients in whom the tumors were large enough to require hysterectomy early in pregnancy, no operations were done in either the antepartum or postpartum periods. An increase in third stage complications was noted. There were no maternal deaths and, excluding the previable infants, only one fetal death.

News Items

The Minnesota Medical Foundation will hold its Annual Dinner meeting at 6:15, November 7th at the Campus Club, Coffman Memorial Union. This is the Friday evening before the Minnesota-Nebraska football game (Dad's Day). Dr. Morris Fishbein, editor of the *Journal of the American Medical Association*, will speak on "Medicine and the National Emergency." Members and friends are urged to attend. Reservations should be sent to 132 Medical Sciences Building, University Campus. Dinner, \$1.00.

Minnesota committee of the Medical and Surgical Committee of America has been enlarged to include Dr. Owen Wangenstein, University of Minnesota; Dr. Claude C. Kennedy, Minneapolis; Dr. William R. McCarthy, St. Paul; Dr. Donald Balfour, Rochester, and Dr. Arthur N. Collins, Duluth.

A group of Mesaba Range physicians, formerly associated with the Rood hospital staff, have purchased the interests of Dr. D. C. Rood, of Duluth, and organized the Mesaba Clinic. Five physicians, Dr. R. L. Bowen, Dr. T. A. Estrem, Dr. C. F. Cartens of Hibbing; Dr. E. K. Rowles of Coleraine, and Dr. P. H. Macfarlane of Chisholm, will operate the new clinic.

Dr. R. A. Glabe was elected president of the Wabasha County Medical Association at a meeting in Wabasha recently. Dr. D. G. Mahle of Plainview is the retiring president. Other officers elected were Dr. Wellman, Lake City, vice-president, and Dr. Wilson, Lake City, secretary-treasurer.

Dr. D. L. Kegaries of Rapid City was elected president of the Black Hills Medical society at a meeting held at St. Joseph's hospital, in Deadwood, yesterday afternoon. About 25 medical men from over the Black Hills were present. Dr. W. L. Matlock of Deadwood was elected vice president; Dr. J. D. Bailey of Rapid City, secretary-treasurer, and Dr. M. O. Pemberton of Deadwood, censor. Dr. E. J. Teeter of Indianapolis, Indiana, of the Eli Lilly research laboratories, an authority on blood diseases, spoke on "Anemia". A lunch was served by the hospital sisters at the close of the meeting.

The Mayo Foundation announces that a series of lectures, demonstrations and clinics by members of the faculty and invited guests will be held during the week of November 10. Problems related to medical and surgical emergencies encountered in civilian and military practice will be emphasized. Physicians are invited to attend.

Dr. G. E. Doty who has been a resident in surgery at the Bismarck Hospital since July, 1941, left on September 23rd for service in the Medical Corps of the United States Navy.

Dr. Paul Burton, Fargo, is the physician on the North Dakota State Appeal Board for the Selective Service. The Board meets once a month in Bismarck.

The North Dakota Health Department, in coöperation with the Committee on Maternal and Child Welfare of the North Dakota State Medical Association, is sponsoring a refresher course on Pediatrics to be given in the Continuation Center for Graduate Study at the University of Minnesota next December. Each district medical society is privileged to send one or more members with all expenses paid. The apportionment is based on membership in each district society. A physician who has attended a similar course in the past is not eligible for this course.

Dr. F. Koren, one of the founders of the Watertown Clinic, Watertown, South Dakota, has resigned from the clinic to become head of the medical department of the Von Drug Company in New York City.

Dr. Ray E. Lemley, Rapid City, South Dakota, has left for Argentina and other points in South America where he will spend the next four or five months studying the prevalence of selenium poisoning.

Dr. Omar Dekker of Edgeley, North Dakota, has opened an office in Finley, North Dakota.

Dr. Guy Ramsey, Philip, South Dakota, is now assisting surgeon in the Eureka, South Dakota, hospital.

Dr. R. E. Pray, associated with Fargo (North Dakota) clinics for the past 14 years, is leaving Fargo for Salinas, California, where he will enter private practice. He will continue to specialize in pediatrics.

According to a joint statement issued on September 4 by the U. S. Director of the Office of Civilian Defense, F. H. LaGuardia, and the Chairman of the American National Red Cross, Norman H. Davis, state and local defense councils are the official agencies responsible for the coördination of all available resources which may be required for civilian protection in the event of belligerent action. Defense councils should therefore acquaint themselves with the resources of the local Red Cross chapters in providing food, clothing, shelter, nursing care, transportation, and other basic necessities and should integrate them into the comprehensive local program. Duplication of trained and experienced personnel and of available supplies of the Red Cross should be avoided except where supplementation is essential to meet the anticipated needs of the community.

The American Association for the Study of Goiter again offers the Van Meter Prize Award of Three Hundred Dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The Award will be made at the annual meeting of the Association which will be held at Atlanta, Georgia, June 1st, 2nd, and 3rd, providing essays of sufficient merit are presented in competition. The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten, double spaced copy sent to the Corresponding Secretary, Dr. T. C. Davison, 478 Peachtree Street, Atlanta, Georgia, not later than April 1st.

Lectures, clinics and demonstrations on the use of sulfonamide preparations in the various diseases will be held at the Center for Continuation Study, University of Minnesota, November 10-12. Other postgraduate medical courses include: Urology, November 10-12; Diseases of Infancy and Childhood, December 15-20.

Dr. James A. Babbitt, emeritus professor of clinical otolaryngology at the University of Pennsylvania School of Medicine, and associate professor of otolaryngology in the university's graduate school of medicine, Philadelphia, was named president-elect of the American Academy of Ophthalmology and Otolaryngology at its annual meeting in Chicago, Wednesday, October 22. Dr. Babbitt will take office January 1, 1943. The present president-elect is Dr. Ralph I. Lloyd, Brooklyn, who will assume office on January 1, 1942. Vice-presidents elected are Drs. Walter Theobald, Chicago; Forrest J. Pinkerton, Honolulu, Hawaii, and Francis E. LeJeune, New Orleans. Dr. Secord H. Large, Cleveland, was re-elected comptroller and Dr. William P. Wherry, Omaha, Nebraska, executive secretary-treasurer.

Dr. Donald C. Balfour, director of the Mayo Foundation, was awarded an honorary doctor of laws degree at a special convocation at the University of Toronto, Canada, October 24.

Approximately 125 children attended the health clinic in Doland, South Dakota, last month. Dr. H. W. Sherwood and Dr. L. R. Edward were in charge of the diphtheria immunization and smallpox vaccination.

A crippled children's clinic will be held November 7 at the Lowe hospital, Mobridge, South Dakota. Attending physicians will be Dr. J. M. Butler, orthopedist; Dr. J. D. Bailey, pediatricist; and Dr. A. Triolo, director of the division of crippled children.

Dr. Herbert Boysen has purchased the practice and equipment of Dr. Everett B. Coulter at Madelia, Minnesota.

Dr. F. W. Behmler, Morris, Minnesota, was re-elected president of the West Central Medical Society at the annual meeting held last month. Dr. Bergen of Clinton was elected vice-president.

Dr. C. R. Svore, formerly of Salt Lake City, is now practicing in Somers, Montana.

Dr. O. D. Dekker of St. Paul, Minnesota, is associated with Dr. E. G. Sasse, Lidgerwood, North Dakota.

Dr. Stuart D. Whetstone, Owatonna, Minnesota, has moved to Cut Bank, Montana.

Dr. Harold Simons, formerly of Butte, Montana, has joined the staff of Green's Eye hospital, San Francisco, California.

The members of the Maternal and Child Welfare Committee of the Montana State Medical Association are as follows: Drs. F. L. McPhail, D. L. Gillespie, G. A. Carmichael, T. L. Hawkins, L. W. Brewer, P. L. Eneboe, E. A. Hagmann, R. L. Towne, L. T. Sussex, A. L. Gleason, S. A. Olsen, E. A. Weldon and H. M. Teel.

Seventeen cases of supplies valued at \$3,523.61 were shipped to the Free French Forces in Northern Africa by the Medical and Surgical Relief Committee of America, 420 Lexington Avenue, during the last week of October, Mrs. Rogers Balcom, executive chairman, announced. This brings the total value of shipments thus far made to this group up to \$59,125.99. The latest consignment included 1,174 instruments, 806 tins of canned food, 7,100 vitamin tablets, 13 gallons of liquid vitamins, and 111,400 aspirin tablets.

Minneapolis junior and senior high school students will have free X-ray chest examinations for tuberculosis beginning in November. The tests are sponsored by the Hennepin County Tuberculosis association, Minneapolis members of the Minnesota Radiological society and the Hennepin County Medical society. The examinations also are planned to be available to parochial schools and schools in rural Hennepin county.

Dr. Marvin J. Geib has opened offices at West Fargo, North Dakota. Dr. Geib, whose former home was at Gaylord, Minnesota, was graduated from the Medical School of the University of Minnesota in 1939. He served a 15 months internship at Minneapolis General hospital and for the past year was physician and surgeon at the state hospital in Fergus Falls.

Dr. P. W. Brown of the Mayo Clinic is now a major in the medical reserve corps of the Army.

Dr. Waltman Walters of Rochester, Minnesota, has been appointed a member of National Institute of Research for Cancer by Dr. Thomas Parran, surgeon general of the United States.

Dr. George U. Ivers, Fargo, North Dakota, who was called into the U. S. Army medical corps last spring as a first lieutenant, has been promoted to captain. He is chief surgeon of the Jefferson Barracks, Missouri, reception center.

Public health officers from all parts of South Dakota met in Huron October 31 for the annual meeting of the South Dakota Public Health association. One of the highlights of the program was a discussion on encephalitis. Dr. O. W. Johnson, Rugby, North Dakota, and Dr. C. M. Eklund, University of Minnesota, took part.

St. James and Murray hospitals in Butte, Montana, and St. Ann hospital in Anaconda are among the hospitals which recently have been approved by the American College of Surgeons.

First Lieutenant George A. Dodds, M.D., of Valley City, North Dakota, was among 255 officers of the medical department of the U. S. Army to graduate from the Medical Field Service school at Carlisle, Pennsylvania, October 25. Representing 42 states and ranging in rank from second lieutenant to lieutenant to lieutenant-colonel, the officers formed the eighth refresher course designed to give graduates in medicine, dentistry and veterinary medicine, training in their military duties for the field.

Classified Advertisements

PRACTICE FOR SALE

Office and equipment of doctor, who, until his death recently, had practiced continuously and successfully for thirty years in the County. Established practice in county seat town, north-central section of South Dakota, that serves large territory. Community has urgent need of good physician at once. In this situation the Northwest District offers you an opportunity. Home is for sale also if desired to make part of deal. Address Box 712, care of this office.

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Want young physician as an associate in country practice, about 75 miles from Twin Cities. Good roads, good practice. A good opportunity for the right man. Address Box 721, care of this office.

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Office space with laboratory facilities. Morning hours available. Box 723, care of this office.

Advertiser's Announcements

PRODUCT ANNOUNCES NAME CHANGE

A change in the spelling of the name "Petrolagar" to "Petrogalar" has been announced by the Petrolagar Laboratories. The change is being made in both the product name and corporate name.

Company officials, while pointing out that the adoption of the new spelling does not affect the formula or quality of the product in any way, said that they considered the change advisable to avoid any possible misconception as to the nature of the product.

"Because it has never been the intention of the company to imply that agar-agar was used for any other purpose than as an emulsifying agent, the last syllable of the former name has been altered in favor of the new spelling," officials said.

Officials emphasized that no change has been made in the size of the package, price, or formulae and that each of the five different types of the product will carry the new spelling "Petrogalar". The new corporate name is: Petrogalar Laboratories, Inc., and the address remains, 8134 McCormick Boulevard, Chicago, Illinois.

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Minneapolis, Minnesota
December, 1941

Vol. LXI, No. 12
New Series

An Evaluation of Vitamin E in the Treatment of Multiple Sclerosis and the Progressive Muscular Atrophies*

Robert L. Meller, M.D.
Minneapolis, Minnesota

THE clinical application of vitamin E therapy to the treatment of certain neurologic conditions in humans has, in several cases, been encouraging¹ and in others rather discouraging.²

Our studies include nine cases of amyotrophic lateral sclerosis, five of primary muscular atrophy, and twelve of multiple sclerosis. Primary muscular atrophy and amyotrophic lateral sclerosis will be discussed together because of the close clinical and pathologic interrelationship of these conditions.³

MULTIPLE SCLEROSIS

Our results in the treatment of multiple sclerosis are summarized in table I.

Of these twelve patients, three experienced varying degrees of remission; two became worse in spite of treatment; and in the rest the condition remained essentially unchanged.

The evaluation of therapy in a condition like multiple sclerosis with its tendency to spontaneous remission is difficult. Our series, though too small for definite conclusions, indicates that vitamin E as administered by us is probably of no value in the treatment of multiple sclerosis.

*From the division of nervous and mental diseases, University of Minnesota Medical School, Minneapolis, A Thesis presented to the Faculty of the Graduate School in partial fulfillment of the requirements for the Degree of Master of Science in Neuropsychiatry.

THE PROGRESSIVE MUSCULAR ATROPHIES

Since encouraging results were obtained in this group of conditions the individual case reports are abstracted in the following paragraphs.

Case 1. U. H. No. 677082, amyotrophic lateral sclerosis. W. J., a 29 year old laborer, was well until November, 1939, at which time he noted low backache which was relieved by rest and exaggerated by activity. This persisted and increased somewhat in severity. A few months later muscle aching on exertion was noted in the upper abdominal wall. For the past year the patient has observed fine muscular twitching in the arms and anterior chest wall. Physical examination was non-contributory. The neurologic examination on August 28, 1940, revealed the following positive findings. A generalized marked hyperreflexia with bilateral unsustained ankle clonus was demonstrated together with weak abdominal reflexes which tired quickly. Generalized weakness was present. The strength of the hand grips as recorded on the spring dynamometer was 100 kg. on the right and 90 kg. on the left. No spontaneous fibrillary twitches were observed, but they could be induced in the left upper extremity by tapping the muscles. Laboratory studies, including repeated urinalyses, blood counts, blood chemistry studies (fasting sugar and urea nitrogen), spinal fluid examination, and flocculation and complement fixation tests for syphilis were negative. X-rays of the right hip, lumbar spine, and sacrum were normal. An air myelogram revealed no abnormalities. The patient was given an eight week's course of intramuscular alpha-tocopherol, 100 mgm. daily. Following this course of treatment he showed a marked improvement. The pain and fibrillary twitches disappeared. Strength became normal. The only demonstrable neurologic abnormality was a questionable hyperreflexia. The abdominal reflexes were normal.

TABLE I. MULTIPLE SCLEROSIS
Tabulation of Drug Therapy

Case	Age	Duration of Disease	Severity of Disease	Result of Treatment	Duration of Treatment	Type of Medication	Dosage
1. H. S., No. 671444	33	2½ years	Moderately severe	Slightly improved	3 months	Wheat germ oil	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter
2. B. M., No. 695027	31	5½ years	Mildly severe	Moderately improved	3½ months	Wheat germ oil	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter
3. C. T., No. 695623	31	6 years	Moderate	Unimproved	4 months 2 months	Wheat germ oil Tocopherex	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter 160 mgm. daily
4. W. J., No. 697922	35	½ year	Severe	Slightly improved	3½ months	Wheat germ oil	4 cc. t.i.d.
5. I. B., No. 653331	29	5 years	Moderate	Unimproved	5 months	Wheat germ oil	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter
6. M. S., No. 677863	23	8 years	Moderate	Worse	3 months 1½ months	Wheat germ oil Tocopherex	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter 160 mgm. daily
7. M. O., No. 673683	26	3 years	Severe	Unimproved	6 months	Wheat germ oil	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter
8. A. D., No. 624545	37	8 years	Very severe	Unimproved	1½ months	Wheat germ oil	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter
9. B. O., No. 684467	31	3½ years	Slight	Unimproved	6½ months	Wheat germ oil	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter
10. O. S., No. 677603	32	2 years	Moderate	Unimproved	5½ months	Wheat germ oil	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter
11. R. T., No. 699327	22	1 year	Moderately severe	Worse	1½ months	Wheat germ oil	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter
12. M. W., No. 688530	30	4½ years	Mild	Unimproved	4 months	Wheat germ oil	15 cc. t.i.d., 1 week 4 cc. t.i.d. thereafter

The strength of the hand grips as measured on the spring dynamometer was 147 kg. on the right and 130 kg. on the left.

Case 2. U. H. No. 681587, amyotrophic lateral sclerosis. J. C., a 38 year old electrician, first noted severe cramps in his legs in July, 1937. These cramps were associated with fibrillary twitchings. In November, 1938, the patient noted beginning weakness in the lower extremities. This weakness gradually progressed so that he had difficulty walking with a cane. The cramps and fibrillary twitchings were persistent. The routine physical examination on April 10, 1940, was noncontributory. The neurologic examination at that time revealed the following abnormalities. The biceps, triceps, and the patellar reflexes were markedly hyperactive. Generalized muscular weakness, most marked in the lower extremities, was present. The tone of these muscles was poor, and fibrillary twitchings could be demonstrated in all the muscles of the trunk and extremities. The patient walked with difficulty with the help of a cane. Laboratory studies, including urinalyses, blood counts, spinal fluid examination, and complement fixation and flocculation tests for syphilis were negative. Intramuscular alpha-tocopherol, 50 mgm. daily, was started on April 11, 1940, and discontinued after two months. During the next six weeks ephynal, 50 mgm. daily, was given. This was followed by a month's course of intramuscular alpha-tocopherol, 100 mgm. daily, together with brewers' yeast, 3.5 gm. daily. Wheat germ oil, 4 cc. three times a day, was given during the next two months. As the patient grew steadily weaker vitamin E therapy was discontinued.

Case 3. U. H. No. 700537, amyotrophic lateral sclerosis. E. J., a 41 year old housewife, noted during the past year stiffness and weakness of her right leg. In April, 1940, slowly progressive weakness and atrophy appeared in the right hand. More recently pain has been noted in the left hand. The physical examination on September 24, was noncontributory. The following positive neurologic findings were demonstrated at that time. Bilateral hyperactive patellar and triceps reflexes were present together with hyperactive right biceps and right positive Hoffmann reflexes. The hands were weak, atrophy being present in the right. The strength of the hand grips as recorded by the spring dynamometer was 25 kg. on the left

and 65 kg. on the right. At this time intramuscular alpha-tocopherol, 100 mgm. daily, was started and discontinued after six weeks. Following this course of treatment, the reflexes returned to normal, the atrophied muscles of the left hand increased in bulk and the hands were stronger (the strength of the hand grips as recorded by the spring dynamometer was 50 kg. on the left and 75 kg. on the right). The subjective complaints of stiffness, weakness and pain disappeared. The patient was placed on ephynal, 20 mgm. daily. On this the patient has noted continued improvement so that after ten weeks, the strength of the hand grips as recorded by the spring dynamometer was 90 kg. bilaterally and no neurologic abnormalities were demonstrable.

Case 4. U. H. No. 690096, amyotrophic lateral sclerosis. L. P., a 45 year old housewife, during the winter of 1929, first noted pain in the right leg, which has persisted. In the spring of 1930, weakness in that limb was noted. In 1933, the left leg became similarly involved. At this time the patient developed a typical unilateral acute Bell's palsy. Weakness of the lower extremities was gradually progressed. In 1937, the upper extremities became involved. This progressive weakness has been associated with fibrillary twitchings and atrophy. The physical examination on April 23, 1940, was essentially negative, except for arthritic enlargement of many of the joints. Neurologic examination at that time revealed the following positive findings. The right facial nerve was markedly paretic. Generalized hyperreflexia was present together with bilaterally positive great toe signs. Marked generalized weakness and marked atrophy were present in both extremities. The patient walked spastically with a scissors gait. Laboratory studies, including urinalyses, blood counts, blood chemistry studies (urea nitrogen, creatinine, fasting sugar, CO₂ combining power, calcium and phosphorus), spinal fluid examination, and flocculation and complement fixation tests for syphilis, were negative. X-ray studies of the right hand and hip showed hypertrophic changes. Intramuscular alpha-tocopherol, 50 mgm. daily, was started on April 23, 1940, and continued for two months. This was reinforced with vi-penta globules, 1 twice daily. No improvement occurred. After a period of rest for eleven days, the patient was placed on ephynal, 50 mgm. daily, reinforced with

brewers' yeast, 3.5 gm. daily. After one month this course of treatment was interrupted for an interval of four weeks. After resumption of ephynal, the patient stated that the medicine made her feel generally better, stronger and more free of pain. Objectively no changes were demonstrable. One month after the resumption of ephynal, vitamin E therapy was discontinued.

Case 5. U. H. No. 698947, amyotrophic lateral sclerosis with mild bulbar involvement. M. K., a 32 year old farmer, in May of 1940, noted attacks of aching in the left hip which were brought on by exertion and relieved by rest. Later this aching became continuous and radiated down the leg. In July of 1940, he noted twitchings of the muscles of this leg. These twitchings spread to involve the other muscles of his body and were associated with a generalized weakness which kept him from indulging in any physical activity. Some time later atrophy of the hands and legs became apparent. The general physical examination on September 5, 1940, was noncontributory. The neurologic examination at this time revealed the following positive findings. The deep reflexes were mildly hyperactive. The abdominal reflexes were present but tired quickly. A mild generalized paresis was demonstrated. The strength of the right hand grip as measured by the spring dynamometer was 47 kg., the left, 60 kg. There was a mild wasting of the interosseous muscles, marked wasting of the thenar and hypothenar eminences, and decrease in bulk of the hamstring and calf muscles. The musculature felt atonic. Marked fibrillary twitchings were observed in the tongue as well as in all muscles of the trunk and extremities. On September 7, 1940, intramuscular alpha-tocopherol, 100 mgm. daily, was started and continued for two months. Ephynal, 100 mgm. daily, was then given for two months. After the first week of treatment, improvement was evident in the decrease in fibrillary twitchings and in the general appearance of improved health. At the termination of treatment the musculature felt more firm and weakness was no longer demonstrable; a spring dynamometer now recorded a strength of 110 kg. in the right hand grip and 105 kg. in the left. The atrophied muscles had increased in bulk. The thighs had increased 4 cm. in circumference, the calves 3 cm., and the forearms 1½ cm. Fibrillary twitchings could no longer be demonstrated in the trunk and extremities but persisted to a slight extent in the tongue. The reflexes were normal.

Case 6. U. H. No. 685515, amyotrophic lateral sclerosis. L. P., a 58 year old farmer, about nine years ago developed a rather persistent low back pain. Six years later he noted progressive weakness and spasticity involving the lower extremities. The weakness was associated with fibrillary twitchings and atrophy of the muscles of the gluteal regions and lower extremities. The routine physical examination on April 15, 1940, was noncontributory. The neurologic examination at this time revealed the following positive findings. The vessels of the optic fundi showed mild arteriosclerosis. The deep reflexes were hyperactive, and the great toe signs were positive with sustained knee and ankle clonus. The legs were spastic, atrophic and paretic. The gait was spastic, cross-legged, and unsteady. A cane was required to maintain equilibrium. Fibrillary twitchings were observed in the muscles of the buttocks and the lower extremities. Laboratory studies, including urinalyses, blood counts, spinal fluid examination, and flocculation and complement fixation tests for syphilis, were negative. X-ray studies of the pelvis, sacroiliac joint, and hip were negative. X-ray of the lumbosacral spine showed minimal hypertrophic changes and spondylolisthesis of the fifth lumbar on the first sacral segment. Intramuscular alpha-tocopherol, 25 mgm. a day, was given for two and a half weeks. As the patient showed no response, the dosage was increased to 50 mgm. and continued for one month. Following this the patient stated that he felt generally stronger and better. His backache had disappeared.

One month after the termination of the first course of intramuscular tocopherol, a second course was started. When the patient returned to begin this treatment he made the following statement: "When I left home to begin my first course of treatment, I was able to walk two blocks with the help of a cane. On returning home following this treatment, I could walk twenty blocks with less difficulty than I had walked the previous two." Examination at this time showed the great toe

signs still positive but less responsive. Knee clonus could no longer be elicited. The legs were definitely stronger, and the gait was more elastic and synergic. For this second course of treatment, which was of five week's duration, the dosage was increased to 100 mgm. daily. A steady further improvement was noted during this period of treatment. The patient was placed on a maintenance dose of ephynal, 50 mgm. daily. Subsequently he reported that he was working satisfactorily as a laborer in a box factory. Vitamin E therapy has been continued. The patient is taking 30 mgm. of ephynal daily and reports continuing increase of strength and ease of locomotion.

Case 7. U. H. No. 688711, amyotrophic lateral sclerosis with mild bulbar involvement. C. A., a 56 year old farmer, for eight years had noted a slowly progressing weakness of his lower extremities and for the past few months had noted a slight dysarthria and dysphagia. The general physical examination on May 22, 1940, was essentially noncontributory. The neurologic examination at this time revealed the following positive findings. A generalized hyperreflexia, most marked in the lower extremities, was present together with bilateral ankle and patellar clonus. The upper and lower extremities were weak with spasticity in the thigh muscles and flaccidity in the calf muscles. An early atrophy was present in the interosseous spaces of both hands. The patient walked with difficulty with a shuffling gait. Mild dysarthria and dysphagia were present. Laboratory studies, including repeated urinalyses, blood cellular studies, and complement fixation and flocculation tests of the blood for syphilis were negative. The spinal fluid examination showed a slight mid-zone colloidal gold curve.

On May 22, 1940, this patient was placed on intramuscular alpha-tocopherol, 50 mgm. daily. After five weeks this was increased to 100 mgm. a day. At this time brewers' yeast, 3.5 gm. daily, was added. Following this course of treatment, the patient noted complete relief from the difficulties with speech and swallowing. His legs were stronger, and he felt more secure and better able to maintain his equilibrium. However, locomotion was still difficult. This improvement appeared after about six weeks of treatment, and the patient's condition remained stationary during the last weeks of therapy. Eight weeks later the alpha-tocopherol was discontinued, and the patient discharged on a maintenance dose of tocopherex, 120 mgm. daily. The patient subsequently reported that this improvement has been maintained, but no additional improvement has occurred. He discontinued the tocopherex after one month.

Case 8. U. H. No. 667155, amyotrophic lateral sclerosis. O. M. is a 57 year old farmer. His illness began in January, 1937, with weakness in the left hand and fine muscular twitches which at first involved the left upper extremity but later gradually spread to involve the entire body. When first seen in our hospital on March 21, 1939, the neurological findings, though diagnostic, were minimal. He was readmitted May 13, 1940, for a trial of vitamin E therapy. During the interval the fibrillary twitches had persisted and the weakness had progressed to such a point that the patient was bedridden. This weakness was associated with marked atrophy, especially in the interosseous spaces of the hands. The patient was unable to lift his heels from the bed. Determination of the right hand grip with a spring dynamometer recorded a strength of 20 kg.; the left hand was only able to hold the dynamometer. The deep reflexes were markedly hyperactive. The abdominal reflexes were absent. Bilaterally sustained ankle clonus was present together with positive great toe signs. Fibrillary twitches were observed. None of the tests for muscular coordination could be carried out because of the extreme weakness. Laboratory studies, including urinalysis, blood counts, blood chemistry studies (nonprotein, nitrogen, and calcium), spinal fluid examination and flocculation and complement fixation tests for syphilis were negative.

On May 14, 1940, the patient was started on intramuscular alpha-tocopherol, 50 mgm. daily. After six weeks this dosage was increased to 100 mgm. and brewers' yeast, 3.5 gm. daily, was added. The treatment was continued for six weeks and wheat germ oil, 4 cc. three times a day, instituted. This was discontinued after one week, at which time the patient was discharged on tocopherex, 120 mgm. a day. A month elapsed after starting treatment before any improvement was demonstra-

ble. This improvement first showed itself in an increase in strength in the legs. He gradually gained sufficient strength to get up out of his chair unaided. To this was added the ability to walk a short distance. Later, strength in the right upper extremity improved. Two weeks before discharge, the strength of the right hand grip as recorded by the spring dynamometer, was 45 kg. The increase of muscle strength in the legs was associated with an increase in muscle bulk; this amounted to 1½ cm. in the circumference of the calves and ½ cm. in the circumference of the thighs. The fibrillary twitchings had practically disappeared; at the time of discharge they were only occasionally observed in the muscles of the thenar eminence of the left hand.

Case 9. U. H. No. 698030, amyotrophic lateral sclerosis with bulbar involvement. T. P., a 36 year old farmer, in January, 1940, noted weakness of his hands. This weakness gradually progressed and became associated with atrophy. A few months later difficulty in walking made its appearance. Since June of 1940, the patient has been bedridden and has noted difficulty with speech and swallowing. Physical examination on July 18, 1940, was essentially noncontributory. The neurologic examination at that time revealed the following positive findings. Cataract was present in the left eye. A paresis of the lower seventh cranial nerves was demonstrable bilaterally. Bilateral nerve deafness was present. Speech was unintelligible and had a pronounced nasal character. The tongue was weak and showed fibrillary twitchings. The right biceps reflex and the left knee and ankle jerks were slightly hyperactive; there were absent abdominal reflexes and unsustained bilateral ankle clonus. A marked generalized weakness was present. Though the limbs were spastic, they were atrophied in the distal portions. The patient could neither stand alone nor walk. Laboratory studies, including urinalysis, hemoglobin, blood flocculation and complement fixation tests for syphilis, were negative. The patient was given ephynal, 100 mgm. daily, for two weeks. This was changed to tocopherex, 160 mgm. daily for one week and 80 mgm. daily thereafter. After four weeks this was changed to ephynal, 150 mgm. daily, and a week later increased to ephynal, 200 mgm. daily, with brewers' yeast, 3.5 gm. daily. Five weeks later wheat germ oil, 4 cc. three times a day, was added. The above routine had little beneficial effect.

Case 10. U. H. No. 656004, Aran-Duchenne type of muscular atrophy. W. K., a 43 year old laborer, was well until the fall of 1934, at which time he noted a very slowly progressing weakness involving the upper extremities and the shoulder girdle. This weakness had its onset in the distal portions of the extremities, spread proximally, and was associated with marked fibrillary twitches and atrophy. When the atrophy became complete, as it had in the hands and forearms at the time of examination, the fibrillary twitchings ceased. The physical examination on April 10, 1940, was essentially negative. The neurologic examination revealed the following positive findings. The arms and shoulder girdle were atrophic. This atrophy was most marked in the hands and the lower forearms. Fibrillary tremors could be demonstrated in the muscles of the trunk and legs. The biceps and triceps reflexes were absent. The knee jerks were decreased. No atrophy was demonstrable in the pelvic girdle or lower extremities. Laboratory studies, including urinalyses, blood counts, spinal fluid examination, and flocculation and complement fixation tests for syphilis, were negative. Intramuscular alpha-tocopherol, 50 mgm. daily, was started on April 11, 1940, and discontinued after two months. Ephynal, 90 mgm. daily, was then given for six weeks followed by a six-week's course of ephynal, 150 mgm. daily. As the patient's condition became worse, vitamin E therapy was discontinued.

Case 11. U. H. No. 693495, Aran-Duchenne type of muscular atrophy. E. S., a 38 year old farmer, in the spring of 1935, first noted weakness of the left hand. This weakness gradually progressed and came to involve the lower forearm. The weakness was associated with a gradually increasing atrophy of the involved area. During the winter of 1937 and 1938, he noted pain on using the involved arm and rather constant paresthesias in this arm. The physical examination on April 12, 1940, was essentially negative. The neurologic examination revealed the following positive findings. Atrophy associated

with weakness was noted in the left hand and to a less extent in the forearm. The left biceps reflex was absent, and the right seemed hyperactive. Fibrillary twitchings of the pectoral muscles occurred spontaneously and fibrillary twitchings could be induced in the muscles of the right arm and occasionally in the legs. Though the patient complained of paresthesias and pain in the hand after exercise, no disturbances in sensation could be demonstrated. Laboratory findings, including repeated urinalyses, blood counts, spinal fluid examination, and flocculation and complement fixation tests for syphilis, were negative. X-ray examination of the cervical and thoracic spine showed slight hypertrophic changes about the thoracic vertebrae. Alphatocopherol, 25 mgm. intramuscularly daily, was started on April 13, 1940, and continued for five weeks. As no improvement occurred, the dosage was increased to 50 mgm. This dosage was administered for a period of six weeks. The only change noted was a definite decrease in the fibrillary twitches. One month after discontinuing treatment, the patient stated that his hand was stronger, that he felt generally better, and that the pain and paresthesias had disappeared. Objectively, no substantial increase in strength was demonstrable. However, fibrillary twitches could no longer be demonstrated. Later the patient stated in a letter that his hand was now more useful to him; though it still was shrunken, he was in no way handicapped by it.

Case 12. U. H. No. 668845, mesencephalic type of muscular atrophy. M. N., a 52 year old housewife, stated that since January, 1939, she had noted a slowly progressing weakness of the external muscles of her eyes and ptosis of the upper lids. For the past year this condition had remained stationary, the eyes being motionless behind drooping lids. The routine physical examination on April 10, 1940, was essentially noncontributory. The neurologic examination revealed complete paralysis of the extrinsic muscles of the eyeballs and bilateral ptosis which hid all but one-fifth of the pupil; the rest of the neurologic examination was essentially negative. Laboratory studies, including repeated urinalyses, blood counts, blood chemistry studies (fasting sugar and creatinine), spinal fluid examination, and complement fixation and flocculation tests for syphilis, were negative. From May 12, 1938, until April 10, 1940, the patient had been treated with ephedrine and glycine without demonstrable improvement. On April 10, 1940, she was placed on wheat germ oil, 15 cc. four times a day for the first week and 4 cc. three times a day thereafter. No objective change was noted in her condition until two months had elapsed. At this time the patient was able to move her eyeballs to a slight degree. This improvement continued. Six weeks later the patient moved her head only very little when looking in extreme lateral directions, was able to raise her lids to completely expose the pupil. Later she was shifted to ephynal, 150 mgm. daily. This the patient decreased to 75 mgm. and later discontinued. She stated that blurring of vision, burning and smarting with excessive lacrimation occurred when she took this medication and cleared up when she discontinued it. Consequently, the patient at her own request was transferred back to wheat germ oil, 4 cc. four times a day.

Case 13. U. H. No. 679722, Aran-Duchenne type of muscular atrophy with mesencephalic and bulbar involvement. J. B., a 50 year old farmer, was well until February 2, 1939, at which time he suffered a transitory attack of weakness associated with a bursting sensation in his head. This was followed in a few hours by loss of consciousness which persisted for one day and was followed by a period of confusion of two week's duration. After this he noted a persistent diplopia, slowness of speech, and generalized weakness most marked in the left arm where atrophy later made its appearance. Persistent head pains and paresthesias were disturbing. The general physical examination on December 20, 1939, was non-contributory. The neurologic examination revealed the following positive findings. The right pupil was larger than the left. Binocular vision was hindered by diplopia which necessitated covering one eye. The left eye did not converge in accommodation and its downward gaze was limited, while the right eye was limited in upward gaze. Horizontal nystagmus was present on looking to the left. There was a generalized depression of all deep reflexes. The left upper extremity was weak and

TABLE II. AMYOTROPHIC LATERAL SCLEROSIS

Case	Age	Duration of Disease	Severity of Disease	Result of Treatment	Duration of Treatment	Type of Medication	Dosage
1. W. J., No. 667082	29	1 year	Mild	Apparently recovered	8 weeks	Alpha-tocopherol	100 mgm.
2. J. C., No. 681587	38	3 years	Moderate	Worse	8 weeks	Alpha-tocopherol Ephynal (Alpha-tocopherol Brewers' yeast Wheat germ oil)	50 mgm.
					6 weeks		100 mgm.
					4 weeks		3.5 gm. 4 cc. t.i.d.
3. E. J., No. 700537	41	6 months	Moderate	Apparently recovered	6 weeks 10 weeks	Alpha-tocopherol Ephynal	100 mgm. 20 mgm.
4. L. P., No. 690096	45	10½ years	Severe	Slight subjective improvement	8 weeks 8 weeks	Alpha-tocopherol (Ephynal Brewers' yeast)	50 mgm. 50 mgm. 3.5 gm.
5. M. K., No. 698947	52	6 months	Moderate	Marked improvement	6 weeks	Alpha-tocopherol Ephynal	100 mgm.
					8 weeks		100 mgm.
6. L. P., No. 685515	54	9 years	Moderate	Marked improvement	2½ weeks	Alpha-tocopherol Alpha-tocopherol (Alpha-tocopherol Brewers' yeast)	25 mgm.
					4 weeks		50 mgm.
					5 weeks		100 mgm. 3.5 gm.
7. C. A., No. 688711	56	8 years	Moderate	Moderately improved	5 weeks	Alpha-tocopherol Alpha-tocopherol (Tocopherex Brewers' yeast)	50 mgm.
					8 weeks		100 mgm.
					4 weeks		120 mgm. 3.5 gm.
8. O. M., No. 667155	57	3½ years	Severe	Marked improvement	6 weeks	Alpha-tocopherol Alpha-tocopherol Tocopherex	50 mgm.
					6 weeks		100 mgm.
					8 weeks		120 mgm.
9. T. P., No. 698030	60	10 months	Severe	Unimproved	2 weeks	Ephynal Ephynal Tocopherex Ephynal (Wheat germ oil Ephynal)	100 mgm.
					1 week		150 mgm.
					4 weeks		80 mgm.
					5 weeks		200 mgm.
					4 weeks		4 cc. t.i.d. 200 mgm.
PRIMARY MUSCULAR ATROPHY							
10. W. K., No. 656004	43	6 years	Severe	Unimproved	8 weeks 6 weeks 6 weeks	Alpha-tocopherol Ephynal Ephynal	50 mgm. 90 mgm. 150 mgm.
11. E. S., No. 693495	38	3½ years	Mild	Improved	5 weeks 4 weeks	Alpha-tocopherol Alpha-tocopherol	25 mgm. 50 mgm.
12. M. N., No. 668845	52	2½ years	Severe	Improved	22 weeks	Wheat Germ Oil Ephynal	15 cc. t.i.d., 1 wk.
					6 weeks		4 cc. t.i.d. 150 mgm.
13. J. B., No. 679722	50	1½ years	Moderate	Markedly improved	7 weeks	Wheat germ oil Ephynal Ephynal	15 cc. t.i.d., 1 wk.
					12 weeks		4 cc. t.i.d.
					6 weeks		50 mgm.
							150 mgm.
14. L. C.	6	2 years	Moderate	Apparently recovered	1 week	Ephynal Ephynal	15 mgm.
					16 weeks		30 mgm.

showed a generalized atrophy which was most marked in the hand where the interosseous spaces were wasted. The strength of the patient's right grip as recorded on the spring dynamometer was 125 kg.; and the left, 90 kg. Speech was noticeably slurred. Laboratory studies, including repeated urinalyses, blood counts, spinal fluid examination, and complement fixation and flocculation tests for syphilis, were negative. X-ray of the skull was reported negative.

In spite of the negative serologic tests for syphilis, the possibility of meningo-vascular syphilis was considered; and the patient given a routine course of neoarsphenamine, reinforced with potassium iodide, 10 drops three times a day, and thiamin chloride, 30 mgm. daily. After five months of this treatment, progression of the symptoms was noted. On April 24, 1940, primary muscular atrophy was considered to be the most likely diagnosis, and wheat germ oil was started, 15 cc. four times a day. On May 24, this was decreased to 4 cc. three times a day. After seven weeks, as no improvement was noted either subjectively or objectively, the patient was placed on ephynal, 50 mgm. daily. Twelve weeks after ephynal was started, the patient showed definite improvement. He felt stronger and generally better. Speech became almost normal. He stated that where at first he had difficulty working a half day, he now could work the entire day without undue fatigue. Only slight

improvement was noted in the eye findings. The strength of his left grip as recorded on the dynamometer increased 15 kg.; the right remained the same. Though strength and tone had definitely improved, there was no increase in muscle bulk. As increasing the ephynal to 150 mgm. daily failed to affect further improvement, vitamin E therapy was discontinued after six weeks. This is an evident case of primary muscular atrophy, but its onset was preceded by some undetermined acute cerebral condition (encephalitis?, lymphocytic meningitis?).

Case 14. Aran-Duchenne type of muscular atrophy. L. C. was a 6 year old school boy. Since the age of 2 years his parents had noted a slowly progressing atrophy and weakness which involved both hands. This atrophy was limited to the hands and involved primarily the thenar and hypothenar eminences. The physical and neurologic examinations on June 10, 1940, were negative except for the hands. These were weak and moderately atrophied. The thenar and hypothenar eminences had lost about half of their bulk. Movement of the thumb and little finger was limited. On June 10, 1940, ephynal therapy was started. Fifteen milligrams were given daily for the first week and 25 mgm. thereafter. After two months this dosage was increased to 30 mgm. On this regime the patient's hands gradually improved to such an extent that by early October they appeared completely normal. This patient comes from

TABLE III. AMYOTROPHIC LATERAL SCLEROSIS
 Tabulation of Symptoms
 (Neurologic findings graded on a basis of 1 to 4)

Case	General Involvement Before Treatment				Dynamometer Readings	General Involvement After Treatment				Dynamometer Readings
	Brain Stem	Hand	Arm	Leg		Brain Stem	Hand	Arm	Leg	
1. W. J.	0	2+	2+	2+	R—90 L—100	0	0	0	0	R—141 L—130
2. J. C.	0	1+	1+	2+	R—125 L—125	1+	2+	2+	3+	R—75 L—40
3. E. J.	0	2+	1+	0	R—25 L—65	0	0	0	0	R—90 L—90
4. L. P.	0	3+	2+	3+	R—9 L—17	0	3+	2+	3+	R—0 L—5
5. M. K.	1+	3+	2+	3+	R—45 L—60	1+	0	0	0	R—110 L—105
6. L. P.	0	1+	1+	3+	R—140 L—135	0	1+	1+	1+	R—140 L—135
7. C. A.	1+	2+	2+	2+	R—60 L—80	0	1+	1+	1+	R—100 L—95
8. O. M.	0	4+	4+	4+	R—20 L—0	0	R—3+ L—4+	R—2+ L—3+	3+	R—45 L—0
9. T. P.	3+	4+	4+	4+	0	3+	4+	4+	4+	0

Case	Specific Involvement Before Treatment				Specific Involvement After Treatment			
	Atrophy	Deep Reflexes	Abnormal Toe Sign	Fibrillation	Atrophy	Deep Reflexes	Abnormal Toe Sign	Fibrillation
1. W. J.	0	2+	+	1+	0	N	0	0
2. J. C.	1+	4+	+	3+	3+	Arms 2+ Legs 4+	+	4+
3. E. J.	2+	Arms 2+ Legs N	0	0	0	Arms N Legs N	0	0
4. L. P.	3+	Arms 2+ Legs 3+	0	0	3+	Arms 2+ Legs 3+	0	0
5. N. K.	2+	Arms 2+ Legs 3+	0	4+	N	Arms N Legs 2+	0	1+
6. L. P.	2+	4+	+	0	2+	3+	+	0
7. C. A.	1+	Arms 4+ Legs 4+	+	0	1+	Arms 4+ Legs 4+	+	0
8. O. M.	4+	3+	+	3+	3+	3+	+	0
9. T. P.	4+	N to 1+	0	0	4+	N to 1+	0	0

PRIMARY MUSCULAR ATROPHY

BEFORE TREATMENT

Case	Brain Stem Involvement	Extremities Affected			Atrophy	Deep Reflexes	Fibrillation
		Arms	Legs	Hands			
10. W. K.	0	4+	1+	4+	4+	Arms 0 Legs N	4+
11. E. S.	0	1+	0	L—2+ R—0	2+	N	3+
12. M. N.	4+	0	0	0	0	N	0
13. J. B.	2+	1+	1+	R—1+ L—3+	3+	Arms 0 Legs N	0
14. L. C.	0	0	0	2+	2+	N	0

AFTER TREATMENT

10. W. K.	0	4+	1+	4+	4+	Arms 0 Legs N	4+
11. E. S.	0	0	0	L—1+	2+	N	0
12. M. N.	2+ to 1+	0	0	0	0	N	0
13. J. B.	2+	0	0	R—0 L—2+	3+	Arms 0 Legs N	0
14. L. C.	0	0	0	0	0	N	0

an extraordinary family in which this condition has been inherited apparently as a Mendelian dominant. The children of the unaffected members of his family are never affected, while in each generation some of the offspring of those affected are always afflicted by this condition. Early in life the afflicted members of this family note a beginning weakness of the hands associated with atrophy as in the case of the onset of the Aran-Duchenne type of primary muscular atrophy. This affects first the hands and, while limited to them in some individuals, in others it spreads proximally to affect the arms to a varying degree. We have acquired data on this family covering a little over one century, and have examined a number of those suffering from this condition.

The preceding cases are summarized in the following tables. Table II summarizes the material treated, the results obtained and the method of treatment used. Table III gives a more detailed summary of the neurologic changes observed.

COMMENT

It will be seen from the above tables that of the fourteen cases receiving intensive vitamin E therapy, three apparently recovered and seven showed definite objective improvement. The degree of improvement varied from case to case. In some cases this improvement consisted of a disappearance of the fibrillary twitching and a gradual increase in the strength of the extremities, while in others there was an increase in the bulk of the atrophic muscles as well as an alteration of the reflex findings towards normal. Of the four cases that showed no response to therapy, two were far advanced cases (cases 7 and 10), one being of the bulbar type (case 7). This lack of response in the far advanced cases has already been mentioned in the literature by other workers. However, it must be kept in mind that in one of our cases (case 5) improvement resulted in spite of the far advanced condition of the illness. Moreover, in another case (case 2), which did not respond, the involvement was not very severe. Consequently, it appears that there is no absolute correlation between the severity of the symptoms and the response to the vitamin E therapy.

Certain other features warrant comment. Improvement in most cases was very gradual, and many weeks of treatment were required before any type of improvement could be demonstrated. These results in our cases are in direct contrast to the report of Wechsler, who observed in one case very rapid improvement with vitamin E therapy and a very rapid recurrence of symptoms after withdrawal of the drug. In our studies, intensive treatment of at least three or four weeks was necessary before any improvement could be observed. Often several months of intensive treatment were necessary before alterations could be detected. This fact is very important because it emphasizes the need of patience both on the part of the physician and of the patient in using this type of therapy.

From the present investigations it is difficult to make a final statement concerning the advisable dosage of the drug to be given in these disorders. It appears that there is a great individual variation of response in different patients. In some of our cases there was a fairly adequate response to small doses of vitamin E (case 12), while in others huge doses were required before any

alteration was noted. Generally we have the impression that the best responses were obtained with the largest doses of the drug. This was seen very strikingly in some cases where no response was observed with small dosage (case 13), whereas as soon as the dosage was increased, improvement appeared. If the intramuscular injections of alpha-tocopherol are to be given in these disorders, probably at least 100 mgm. daily should be used over a period of six to eight weeks. On the other hand, if the oral drug is to be used, 150 to 200 mgm. daily seems to be adequate dosage over a similar period of time. Insufficient dosage may account in many cases for the poor results reported by some workers. At present, we have no definite information concerning the necessity of continuing the medication after the initial course of treatment. In all our cases except two, the patients have received oral vitamin E following the initial course of the intramuscular injections. However, two cases (cases 5 and 11) to whom only the initial course of intramuscular treatment was administered, have maintained their improvement over a period of several months.

No toxic symptoms attributable to the medication were observed in any of our cases. This, too, has been the experience of others who have reported on this vitamin.

The fact that response to vitamin E is not uniform in all cases, suggests that probably amyotrophic lateral sclerosis and primary muscular atrophy are really symptom complexes with a number of etiologic bases. The results of these studies suggest that one cause of these conditions is some nutritional or metabolic disturbance involving vitamin E.

The response of both amyotrophic lateral sclerosis and primary muscular atrophy to the same drug suggests that these are not separate entities but are only different manifestations of one pathologic process. This idea is not original. Many neurologists tend to classify both conditions in the same group and have observed an occasional case where clinically a differentiation between the two could not be made with certainty. Furthermore, it has been observed microscopically that there is a varying amount of lateral column degeneration in almost every case of progressive muscular atrophy, making the condition in these cases indistinguishable pathologically from amyotrophic lateral sclerosis.

When this new evidence of response in many cases of both diseases to the same therapeutic agent is added to these already well-known facts, one feels justified in the conclusion that the present separation of these two conditions is not entirely logical. Consequently, the suggestion is made that a single more descriptive term such as motor neuronopathies be used in place of the old terms.

Case 14 merits particular attention. In this case the hereditary nature of the muscular atrophy is clearly established. Nevertheless, a good response, apparently complete recovery, was obtained with vitamin E (ephy-nal). It would therefore appear that a pessimistic attitude toward the treatment of a condition because of its hereditary nature should be avoided.

SUMMARY

1. Twelve cases of multiple sclerosis showed no response to intensive vitamin E therapy.
2. Of 14 cases of varying types of progressive muscular atrophy treated with vitamin E, 3 apparently recovered, 7 showed definite improvement and 4 failed to respond.
3. The need for large dosage over a long period of time is pointed out and the following doses suggested: 100 mgm. daily of alpha-tocopherol intramuscularly for six to eight weeks or 150 to 200 mgm. of the drug orally over a similar period of time.
4. No toxic symptoms attributable to the medication were observed.
5. Evidence is presented to show that at least some cases of amyotrophic lateral sclerosis and primary muscular atrophy are metabolic or nutritional diseases.
6. The brilliant response to vitamin E therapy of a hereditary case of muscular atrophy is reported. This case supports the proposition that hereditary factors do not necessarily determine conditions as hopeless from the therapeutic standpoint.

7. It is suggested that the terms amyotrophic lateral sclerosis and primary muscular atrophy be replaced by the more descriptive term motor neuronopathy.

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3. We are indebted to the following manufacturing concerns for supplying us the drugs: Merck and Company for the preparation of alpha-tocopherol in peanut oil for intramuscular administration; Hoffman-La Roche, Inc., for the ephynal, tablets of alpha-tocopherol acetate for oral administration; to Squibb and Sons for the tocopherex capsules of naturally occurring tocopherols for oral administration; and to the Archer-Daniels-Midland Company for the wheat germ oil.

X-Ray Technique*

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WHILE there have been many changes, improvements and advances in X-ray technique in the past few years, most of these have had to do with improvement in existing machines and the invention of new instruments to facilitate diagnoses. Each year several thousand films made elsewhere are sent to me for an opinion. It has been my observation that the quality of these films has been steadily improving. In the capacity of consulting radiologist to several of the major railroads, I see many films made under difficult circumstances and often in the smaller hospitals. Even in such cases rarely do we have to ask for a re-take on any of the films. However, I do find that the oblique view of the wrist is practically never made. I believe this view should be made routinely on all cases as it is often the only view in which a fracture of the scaphoid bone can be demonstrated.

There is one place, however, where the films are almost invariably of poor diagnostic quality and where an opinion cannot be given on the evidence shown on the films. This place or area is the stomach. Good gall-bladder films are the rule. Films made of the colon after the administration of a barium enema are almost invariably diagnostic, but the stomach films are practically always a total loss. For this reason, I am giving a de-

tailed description of how satisfactory stomach films can be made. There are only two things which are absolutely necessary: (1) a transformer of sufficient capacity to make stomach films on a heavy patient in one-fourth of a second; (2) an X-ray table that permits of both fluoroscopy and plating with the patient in the horizontal position. While more elaborate equipment permits of faster work, the above equipment will be all that is necessary for satisfactory work.

After observing the outline of the esophagus with a vertical fluoroscope during the administration of the barium meal, the stomach is fluoroscoped in the erect position. The next move is to fluoroscope the patient in the horizontal position, the patient lying on his back. This enables the physician to obtain a good view of the cardiac end of the stomach and to note the presence or absence of any herniation of any portion of the stomach through the esophageal opening in the diaphragm.

When this has been completed the patient is turned over so as to lie on his abdomen. The patient should now be rolled slightly so as to lie partially on the right side of his abdomen. The maintaining of this position is made easy by flexing the left hip and the left knee of the patient, thus allowing part of his weight to rest on the inner surface of his left knee joint. This maneuver accomplishes two important things. First, it prevents the cap or first portion of the duodenum from being

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forced against the under surface of the liver; secondly, it removes spine pressure from the stomach. With the patient in this position the outline of the stomach can be traced on the patient's back with a skin pencil. The next step is to take two folded blankets and place one under the chest and one under the pelvis of the patient. Then once more be sure that part of the body weight is supported by the inner side of the left knee. You will find that the entire stomach can be covered by an 8x10-inch cassette. At least eight films should be made. If this maneuver is carefully followed out it is possible to maintain a constant relationship between the tube, the patient, and the cassette without moving the patient in any manner to change cassettes.

Such a series of films can be mailed to your consulting radiologist in doubtful cases. This will furnish enough evidence for an accurate diagnosis. Any procedure short of this is wasteful, inaccurate and misleading to both the patient and the physician.

Now that we have solved the problem as to satisfactory stomach films, let us consider some of the advances that have been made in the past few years in apparatus and appliances.

First let us consider the rotating target X-ray tube. Prior to its invention the amount of current we could safely send through an X-ray tube was determined by the size of the stationary target. Consequently it was never possible to obtain films with a wealth of detail of moving parts or of parts which were moved by transmitted pulsation. For example, the root shadows of the lungs would show motion from the transmitted heart beat. In the same manner the pulsation of the abdominal aorta and the peristaltic movement of the small intestine interfered with obtaining good gall-bladder films.

The rotating target tube however, owing to the rapid dissipation of heat in the target, permits the use of a much smaller focal spot and the passage of larger amounts of current with almost instantaneous exposure. The resulting films show a wealth of detail not obtainable in any other manner. The disadvantage of this tube lies in the fact that it requires a much larger X-ray transformer to properly energize it and an impulse timer to accurately control the exposure time. Faster Potter-Bucky diaphragms are also necessary for these rapid exposures.

BODY SECTION RADIOGRAPHY

This term is used to cover the many instruments which have been devised in the past few years to enable the radiologist to obtain beautiful detail of any particular organ or part of the body he may desire. This is done by an appliance variously called, tomograph, stratigraph, planigraph, and the laminagraph.

All of the instruments are based on the same basic physical principle; the principle being, that during the X-ray exposure, a synchronized, coördinated movement of the X-ray tube and film take place about a fixed axis in such a way that shadows of objects in this axis maintain a contrast relationship to film and tube. Objects not in this axis have a shifting relationship, so their shadows are dispersed. Up until only a few months ago the radiologist was faced with the alternative of spending many thousand dollars for such an instrument or trying to build a satisfactory one of his own. Fortunately the manufacturers have within the past few months built an inexpensive hand operated machine and one only slightly more expensive that is motor driven. The preliminary work with this apparatus has already yielded astounding results and the ground as yet has hardly been broken. So far it has been employed chiefly in diseases of the lungs, and in obtaining hitherto impossible detail in obscured portions of the spinal column, chiefly the upper cervical and upper dorsal areas.

This method of diagnosing will always remain moderately expensive and time-consuming when one is exploring the "unknown". An example of this is lung detail obscured by markedly thickened pleura. In such a case it will be necessary to make individual plates for every 2 cm. thickness of the affected portion of the lung.

However, when we know where the pathology lies, for example in the laminae or pedicles of the spine, only one or two plates will be necessary. The method is of great value in intravenous urograms in children where intestinal gas is almost invariably a complicating factor. Here it is possible to focus directly on the kidneys and obtain a wealth of detail regarding the kidney pelves and calyces.

This is the only method by which a diagnostic plate can be made of the sternum in a postero-anterior position. Fractures and tumors of the sacrum can be shown with great distinctness. So far, as I have before stated, the greatest aid has been in the recognition of pulmonary cavities lying beneath thickened pleura and in differentiating small bronchial carcinomas from other lesions causing partial or complete bronchial obstructions. This method is of particular value in areas which, due to their locations, are not in reach of the bronchoscope.

Bear in mind, however, that this method of diagnosis in no way replaces the usual films made for diagnosis. These will always have to be made. But this method will be increasingly used to identify and isolate pathology seen in the usual films.

In addition it will be used routinely to rule in or out pathology or trauma in areas hitherto inaccessible to X-ray examination.

Oliguria and Hematuria Following Administration of Sulfathiazol and Relieved by Renal Pelvic Lavage*

Case Report

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A 36 year old white female was admitted to the Gynecological Service at the Minneapolis General Hospital on August 9, 1940. Her chief complaint was lower abdominal pain which had occurred after menses for the past 11 years, following an infected abortion. No symptoms of renal disease were noted. Her family history was negative. Her husband had died from some cause unknown to her. Following delivery 15 years ago, the patient had pneumonia, and during pregnancy 12 years ago, she had a severe toxemia with hypertension. Both children were living and well. She had had no operations nor accidents, and denied venereal infection. Onset of menses occurred at 12 years. They were entirely normal until the infected abortion. For the past 11 years she has had dysmenorrhea, menorrhagia, and leucorrhea.

Physical examination showed a well developed and well nourished white female who did not appear to be acutely ill. The neck folds, navel, breasts, and inguinal regions showed tinea superficialis. Aside from the abdomen and the pelvis, the rest of the examination was negative. The abdomen was flat and flaccid. There was a non-tender, fixed mass which came to within two fingers of the anterior-superior iliac spines, and which had a rounded upper border. On pelvic examination the external genitalia were found to be negative except for a palpable left Bartholin gland and old mid-lateral and midline lacerations. The cervix pointed down and back and showed an old laceration on its left side. The corpus lay to the left of the midline anteriorly and was increased 50 per cent in size from normal. There was a large cystic mass 10 to 12 cm. in diameter and partly fixed on the right side. The left adnexa was tender and indurated.

Urinalyses showed specific gravities of 1.022, 1.022, and 1.015; acid reaction, from negative to very faint traces of albumin; no sugar, casts, red blood cells, or pus cells. Hemoglobin was 88 per cent; red blood cell count, 4,860,000; white blood cell count, 7,000; with a differential count showing 64 per cent P.M.N.'s, 32 per cent lymphocytes, 3 per cent monocytes, and 1 per cent eosinophiles. The Rytz, Kahn and Wassermann reactions were negative. Cultures from the nose and throat for bacillus diphtheriae and from the cervix and urethra for gonococci were negative.

The clinical diagnosis was chronic salpingo-oöphoritis

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with possible endometriosis, and pelvic exploration was advised. On August 12, 1940, a subtotal hysterectomy and bilateral salpingo-oöphorectomy was done by one of us (J.F.S.) under ethylene and ether anesthesia together with ½ per cent procaine local anesthesia. The patient's condition was good all during the operation—blood pressure never was under 100/70. The trachea was aspirated and the patient was hyperventilated at the end of the anesthesia. She was further hyperventilated for three minutes every two hours with 30 per cent carbon dioxide in oxygen for 12 hours. The post-operative temperature level was 100 degrees and her output was good.

On August 15, 1940, the patient developed a cough associated with pain in the chest. Type VIII pneumococci were found in the sputum, and a bedside X-ray could not definitely rule out either atelectasis or pneumonia. The patient was started on equal parts of sulfathiazol and sodium bicarbonate. An initial dose of four grams of each was given, then one gram of each was given every two hours for six doses, then one gram of each every four hours. In spite of the sodium bicarbonate given, urine specimens remained acid. No bicarbonate solution was given intravenously. On the morning of August 16, 1940, a catheterized urine specimen showed many red blood cells and the patient appeared drowsy. The urinary output which had been adequate immediately postoperatively, was down to 355 cc. on this date. The following day, August 17th, gross hematuria and edema were first noted, and the sulfathiazol was stopped. A total of 18 grams had been given. The sodium bicarbonate was continued. The total urinary output on this day was 190 cc. On August 18, 1940, the patient was markedly edematous and very drowsy, and in spite of large quantities of hypertonic glucose given intravenously she had a urinary output of 275 cc. From 12 o'clock midnight to 12 o'clock noon on August 19th, the output was 80 cc. The patient was taken for cystoscopy at noon on August 19, 1940.

Cystoscopy was carried out by one of us (N.O.B.) using the Brown-Buerger cystoscope under general anesthesia with 525 mg. of sodium pentothal given in 2½ per cent solution. The bladder mucosa and trigone appeared normal. The ureteral orifices were slightly reddened and no urine was seen to spurt from them. On the bladder floor was some brown earthy material which on examination proved to be precipitated argyrol and sulfathiazol crystals. A No. 7-F ureteral catheter was passed on the left and a No. 8-F ureteral catheter on the right for 18 cm. each without meeting any ob-

struction whatsoever. No urine drained from either catheter. Using 3 cc. of warm distilled water at a time, both renal pelves were lavaged for 20 minutes. Following this, a few cubic centimeters of urine were collected from each side. That from the left showed 66.7 mg. per cent and that from the right showed 47 mg. per cent sulfathiazol. The cystoscope was removed, leaving the ureteral catheters in place. The pelves were lavaged three times again on the same day and once on the following day. From cystoscopy to midnight on August 19th the total output was 780 cc. On August 20th the patient seemed to be markedly improved and her output was 1,175 cc. On August 22nd all edema had disappeared, and the output continued to be high

so the ureteral catheters were removed. The hematuria decreased until August 26th when a catheterized specimen showed 0-1 R.B.C. and 3-5 pus cells per high power field. The B.U.N., which had been 46.2 mg. per cent on August 18th, was down to 15.8 mg. per cent on September 4th. The creatinine dropped from 6.2 mg. per cent to 2 mg. per cent in the same length of time. The P.S.P. excretion was 28 per cent in two hours on August 24th and increased to 69 per cent on September 4th. A concentration test done on September 4th showed the urine to have a specific gravity of 1.026. The patient was discharged from the hospital on September 7, 1940, in good condition.

Diagnosis of Rheumatic Fever

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UNTIL the etiology is discovered, it will be necessary to make the diagnosis of rheumatic fever from the clinical picture. The rheumatic infection is characteristically variable in its manifestations, yet a correct diagnosis can be made in the great majority of instances if the disease is well understood. In recent years, several methods have been introduced to assist in making a diagnosis of rheumatic fever. These include a number of complicated laboratory procedures, skin tests, throat and blood cultures, the artificial production of rheumatic nodules, etc., but none of them has proved of practical value. It is necessary to understand well the clinical signs and symptoms of the rheumatic state in order to make an early diagnosis. One of the most important facts that has come out of the vast amount of research done on this disease in recent years is that rheumatic fever is essentially a chronic, long continued infection. The comparison of rheumatic fever with tuberculosis and syphilis is well taken. To understand the rheumatic state thoroughly, one must be impressed with its chronicity. We speak of repeated attacks of rheumatic fever each spring and fall for a number of years. Actually, in most instances, this is the same attack with exacerbations. Frequently, patients are seen who become infected with rheumatism, continue to show evidence of low grade infection for months and years; gradually the heart becomes involved, and the patient may expire with active carditis and every evidence of rheumatic activity.

INCIDENCE

Rheumatic fever occurs most commonly in the temperate zones. It is relatively rare in the tropics as well

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as in the arctic regions. As is well known, it occurs most commonly in the lower economic groups and is distinctly a familial disease. It occurs most commonly in the early spring and late fall and is relatively uncommon in the midst of the summer and during the cold winter months. Rheumatic fever becomes prevalent during epidemics of upper respiratory infections and is prone to occur when scarlet fever is prevalent. Many cases of rheumatic fever develop immediately after scarlet fever, and there seems to be some definite relationship between these two diseases.

It is primarily a disease of early childhood, and it occurs most frequently between the ages of 5 and 8. It is about equally distributed in both sexes and is common in all racial groups. There seems to be no correlation between the number of attacks and the extent of cardiac damage. In my own experience, a number of patients with marked cardiac involvement have had only a single attack of rheumatic fever, yet other children who had had several attacks escaped with no cardiac damage. The earlier the onset of the disease, the more likely is the heart to be attacked, and the more severe the attack of rheumatic fever, the more involvement in the heart. It has been stated that practically every patient with rheumatic fever shows some cardiac involvement, and that 60 per cent of such patients will eventually develop permanent damage of the heart. This is especially true in children.

In studying the histories of our patients with well developed rheumatic heart disease, I found that they gave a positive history of rheumatic infection in practically every instance. Recently, in analyzing 100 such histories, I found that 60 per cent of the patients had acute polyarthritis; 8 per cent chorea; while 16 per cent had both

acute polyarthritis and chorea; 10 per cent had subacute polyarthritis; 4 per cent primary carditis; while 2 per cent gave no history of rheumatic infection of any kind. Thus a positive rheumatic history was obtained in 98 per cent of these patients.

In the typical case with joint involvement, diagnosis is not difficult. The joints become stiff, painful and red, and the process jumps from one joint to another. The child is bedridden with fever and toxemia and the diagnosis is apparent. In a smaller group, however, the polyarthritis may be so mild that the child may limp about but may never go to bed, and the diagnosis is easily missed for some time. Such patients often have slight swelling and local heat of various joints which are overlooked by the parents. If examined carefully, they will often be found to have a low grade fever. Patients with these symptoms need to be differentiated from normal children who complain simply of leg pains. In a number of recent articles on rheumatic fever, patients with so-called growing pains have been considered as rheumatic patients. As has been stated, a small group of patients with rheumatic fever have mild joint symptoms. However, the great majority of children who complain of leg pains are not suffering from rheumatic fever. At times, it is difficult to differentiate these two groups of patients. As a result of a number of years of experience with this problem, I have worked out the following differential diagnostic chart which should assist in separating children with subacute rheumatic fever from normal children who complain of leg pains.

Differences Between Non-Rheumatic "Growing Pains" and Joint Pains of Subacute Rheumatic Fever

	Non-Rheumatic "Growing Pains"	Joint Pains of Subacute Rheumatic Fever
Age at Onset	Early childhood—often continue through adolescence.	Most commonly between 6 and 7 years of age—often occur in attacks following upper respiratory infections or other infectious diseases.
Time of Pain	At end of day—especially during night, often awakening the child several times. Pain is gone in the morning and usually does not occur during the day.	On first getting out of bed in the morning—during entire day—especially on motion; often causing limp. Patient feels better on getting warm in bed.
Location of Pain	Most commonly in muscles of legs and thighs—rarely in muscles of upper extremities. Occasionally involves knee joints.	In joints, themselves, of upper and lower extremities.
Other Signs of Rheumatic Activity	Usually none.	Repeated bouts of joint pains; nose bleeds, characteristic skin rash; pallor, fever, etc.
Objective Signs in Joints	None.	Joints often have slight increased local heat and mild swelling usually overlooked by patient and parent.
Family History of Rheumatic Fever	Uncommon.	Common.
Laboratory Findings	Normal sedimentation rate. Normal leucocyte count. Normal hemoglobin.	Increased sedimentation rate. Mild increase in leucocyte count. Moderately decreased hemoglobin.

Among the diagnostic clinical signs which occur most commonly with the polyarthritis of rheumatic fever are the rheumatic nodule and certain skin manifestations. The rheumatic nodule is almost pathognomonic of rheumatic fever. The incidence of those nodules varies in different parts of the world. In England, they are quite common. They are also fairly common along the east coast of the United States, but in the middle and far west, they are quite rare. In our clinic, I have seen rheumatic nodules most commonly in those patients who had serious rheumatic disease and in whom the prognosis was not good. The nodules are usually small, about the size of a grain of wheat, but they may be considerably larger. They commonly occur in crops and appear to be attached to the joint tissues or periosteum, but the skin over them moves freely. They are usually quite hard and not particularly tender. They are most often found over the elbows, knuckles, wrists, knees, scalp and under the skin over the vertebral column. The nodules may be present for only a few days or may persist for weeks.

The *skin rash* of rheumatic fever occurs most often in association with polyarthritis. Erythema marginatum may be considered almost pathognomonic of rheumatic fever. This is a most interesting skin condition. It may appear and disappear several times in the same day. It occurs over the entire body but most commonly over the chest and abdomen. It is characterized by circular serpiginous lesions with a pale center and a fine thread-like, slightly raised, reddish border. As has been stated, the rash is extremely evanescent. It is considered significant of rheumatic activity, yet I have known patients who have continued to have erythema marginatum for many weeks and months with no other evidence of rheumatic activity, even with a normal sedimentation rate. Erythema multiforme is common in children with rheumatic fever. It can occur suddenly over the entire body and in some instances a differential diagnosis may be difficult. The rash may be widespread and simulate measles. Urticaria is not common. In one patient in our convalescent ward at the present time, rheumatic nodules appear in crops and with each crop of nodules an additional patch of urticaria appears over the skin. Urticaria may occur over the entire body. In spite of what has been written to the contrary, erythema nodosum, in my experience, is unusually rare. I can remember only one instance in which erythema nodosum occurred during an attack of rheumatic fever. I have seen one case in which purpura was a complicating factor in an otherwise relatively mild attack of rheumatic fever. Psoriasis has been mentioned in relation to rheumatic fever, but I have not seen it. It most commonly occurs in connection with chronic atrophic arthritis.

Spontaneous severe nose bleeds often accompany rheumatic infection. Epistaxis is usually a sign of continued rheumatic activity. The usual blood examination is not characteristic in rheumatic fever. However, the sedimentation rate of the red blood cells is of extreme value both in diagnosis and in judging the activity of the infection. The sedimentation rate is used in all clinics and hospitals where rheumatic fever is treated. It is a

simple test and can be done in any office. Children with rheumatic infection will invariably show an increased sedimentation rate.

Chorea. Chorea has long been considered a major manifestation of the rheumatic state. In the last few years, however, some studies have appeared which tend to cast doubt on the rheumatic background of chorea. It has been demonstrated that choreic patients usually do not show evidence of chronic infection. They have no fever and the sedimentation rate is usually normal. According to these writers, chorea alone rarely causes rheumatic endocarditis; it is only when polyarthritis occurs in association with chorea that the heart becomes involved. The majority of investigators are not altogether in accord with this point of view. Most of them still believe chorea is rheumatic in origin and that it is an important cause of rheumatic heart disease.

Chorea occurs most frequently during the adolescent period; it is five times more common in girls. It may follow immediately after an emotional upset. Acute polyarthritis and chorea rarely occur at the same time but more frequently alternate in occurrence. In the typical case, the diagnosis is not difficult. The characteristic muscular incoördination is quite diagnostic. Chorea may involve only half of the body and appear as hemichorea. In some of these cases, there is a pseudo-paralysis of a flaccid nature, and the patient may drag an arm and leg simulating hemiplegia. The heart is usually moderately involved; the endocarditis develops gradually. In most instances, the condition clears up in a few months but chorea may persist in a mild form for years. It is sometimes difficult to differentiate chorea from the early muscular incoördination of encephalitis. Patients with early chorea sometimes attend school for weeks, having more and more difficulty in writing, sewing, gymnasium, etc., before the condition is recognized. It would be well if all teachers and school nurses could see a case of active chorea. They could help in making an early diagnosis.

Carditis. In another small group of patients, the rheumatic infection manifests itself as a primary carditis. Such patients often complain of fatigue. They have a low grade fever, usually develop a pallor, and the diagnosis may be doubtful for some time. The onset may be quite sudden and severe, with high fever and prostration, and the diagnosis will not be clear until the signs of endocarditis become apparent. In most of these patients, the onset is gradual and the diagnosis becomes definite when the heart condition is detected. The signs of infection may continue for many weeks before the endocarditis is developed enough so that a diagnosis can be made. In any child with an unexplained low grade fever, the diagnosis of primary rheumatic carditis should be considered.

DEVELOPMENT OF RHEUMATIC HEART DISEASE

Rheumatic heart disease is not a complication of rheumatic fever but it is part of the disease. The cardiac involvement may be acute and severe from the very outset, causing a pancarditis with pericardial effusion followed by early death due to toxemia. Fortunately, the

cardiac involvement is more often gradual in nature. A systolic murmur may appear early in the process and suggest mitral disease. However, it is not uncommon for such murmurs to disappear after the acute condition recedes. A positive diagnosis cannot be made until many months have elapsed; the heart may escape damage entirely but even when the systolic murmur disappears for a time one may be surprised to find a well-developed mitral stenosis in such a patient a year or two later. The first sign of aortic regurgitation is the distant blowing diastolic murmur heard along the left border of the sternum. This murmur is missed more often than any other. Some men seem to be unable to hear the diastolic murmur. This murmur may appear and disappear from time to time until it finally becomes constant. At this time, the peripheral circulatory findings may be entirely normal and the characteristic Corrigan's pulse and blood pressure changes may not appear for many months.

The electrocardiogram has been used experimentally to demonstrate myocardial involvement in rheumatic fever. Electrocardiography is of value in a hospital where research is being carried on in rheumatic fever. However, the information obtained from electrocardiography in the usual case is of so little practical value that I do not believe tracings are necessary in the individual patients treated by the private physician. Much more important is the X-ray examination. Early in the onset of rheumatic heart disease, the X-ray films may show the heart normal in size and contour, but it will not be long before some evidence of change either in contour or size develops. There has been considerable research carried on in X-ray of the heart. Much stress has been placed on the inaccuracy of the usual cardiothoracic measurements. Many workers believe that the earliest signs of cardiac involvement may be detected much more efficiently with the aid of the fluoroscope. I am inclined to agree with this point of view, but it is my impression that many mistakes will be made, as it is often difficult to determine when the heart is or is not slightly enlarged. If the X-ray examination is used properly, that is, as only one part of the physical examination and coordinated with other clinical and laboratory findings, mistakes will be fewer.

CONCLUSIONS

There is no known diagnostic laboratory test for rheumatic fever. The diagnosis must still be based on the clinical picture. Rheumatic fever is characteristically a chronic low grade infection. It manifests itself most commonly as an acute polyarthritis or chorea. It may, however, appear as a subacute polyarthritis which must be differentiated from non-rheumatic leg pains. In a small percentage of patients, the condition appears as a primary carditis. The rheumatic nodule and erythema marginatum are pathognomonic of rheumatic infection. Cardiac involvement is usually slowly progressive and can be detected by careful auscultation from time to time and by repeated X-ray studies. The sedimentation rate of the red blood cells is a useful diagnostic procedure in rheumatic fever.

Effect of Gelatin Feeding on Strength and Weight According to Body Build

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IN a recent thesis entitled "An Attempt to Determine the Effect of Gelatin Feeding in Relation to Strength, Endurance and Weight of College Women" Miss Florence Tennant¹ observed 211 Stanford women. Half of these took gelatin for 28 days, while the other half, matched for activity programs, were used as a control group.

Gelatin was taken in the amounts recommended by the Knox Gelatin Company who supplied the material. Each girl took one ounce of gelatin daily for the first two weeks and one-half ounce daily for the second two weeks. Weight and strength were measured and recorded before and after the test period for both the experimental and control groups in the same way. One hundred forty-one women finished the study; 71 who took gelatin and 70 in the matched control group who did not.

Results of the objective portion of the study showed that the mean strength of right hands increased with the administration of gelatin from 72.46 to 75.18 kilograms. This increase of 2.72 kilograms represents 3.7 per cent as compared to 2.3 per cent for the control group. The critical ratio of 3.06 indicates the small statistical significance of this finding. The mean strength of left hands increased from 63.88 to 65.96 kilograms. This increase of 2.08 kilograms represents 3.3 per cent as compared to a zero gain in the control group. The mean weight of the group on gelatin increased from 133.15 to 134.60 pounds, a gain of 1.45 pounds as compared to a mean loss of .03 pounds in the control group.

Since it is apparent that very small gains were made in both strength and weight by 71 women who took gelatin, and similar gains were not made by 70 women in a matched control group who did not take gelatin, a further analysis has been undertaken. The present study is an attempt to find out what factors, if any, were common to the groups who showed positive or negative results.

Ray, Johnson and Taylor² carried on a series of experiments at the Long Island College of Medicine with gelatin feeding. They showed that adequate amounts of gelatin increased the amount of work performed 38 to 240 per cent before muscular fatigue set in when they used male subjects. They reported that in women gelatin did not increase the amount of work performed before muscular fatigue because of the marked sexual difference in ability of men and women to store creatine, and suggested that the effect of gelatin is particularly concerned with the action of glycine (or glycocholl) in building creatine. In the experiments of Ray, Johnson

and Taylor the subjects were trained on the ergometer until the maximum work output was constant. Then 10 to 15 grams of glycocholl were added to the daily diet. The investigators noted that subjects who were of slight build reacted most promptly to glycocholl and showed gain in body weight. Both phosphoric acid and creatine are now assigned an important role in the chemistry of muscular contraction. Boothby^{3,4} reported that the onset of muscular fatigue could be delayed by adding enough glycine to the diet of a normal person. He showed also that giving glycine in certain disease conditions as progressive muscular dystrophy helped to restore wasted muscle tissue. Gelatin which contains 25 per cent glycine is an acceptable source of this important amino acid. It is an established fact that glycine is an amino acid which can increase the creatine content of skeletal muscle, and glycine has been used successfully in treating certain myopathies.

Dr. Hellebrandt⁵ challenged the conclusions of Dr. Ray that it was the addition of gelatin to the diet that increased endurance 100 per cent in the experimental subjects. Hellebrandt found neither increase nor decrease in athletic improvement when gelatin was added to the normal diet in his experimental study.

Dr. George Maison⁶ of Detroit who also failed to confirm Dr. Ray's findings reasoned that if gelatin has any effect on fatigue, its ingestion should increase the work output of individual muscles. He undertook experiments to test work ability before, during and after ingestion of gelatin. Six subjects were trained for five weeks and then given 60 grams of gelatin a day for 21 to 31 days. No obvious difference could be demonstrated in amount of work done and when the gelatin was withdrawn there was no decrease to be seen. Two subjects trained for one year showed no increase in work ability when given gelatin or amino acetic acid.

Miss Tennant's study also failed to demonstrate significant changes in strength and endurance as the result of gelatin feeding. However, the authors were interested in nutritional aspects of gelatin and consequently investigated the role of body build and weight in the Stanford study.

Tabulations were made of strength and weight changes according to the body build of the girls. Build was indicated in terms of the width-length index, or body width, in proportion to standing height as described elsewhere. A small index indicates a slender-built person and a large index indicates a broad-built person. For the tabulation, indices which were more than a standard deviation below the mean for the age-sex group were classified linear; those more than a standard deviation

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TABLE I.
Strength Changes Right Hand According to Body Build

A.		Linear		Lateral		Intermediate	
Gelatin Group (70 cases)	No. Cases	Pct.	No. Cases	Pct.	No. Cases	Pct.	
Gain	9	60	19	62	11	46	
Loss	3	20	9	28	10	42	
Same	3	20	3	10	3	12	
B. Control Group (68 cases)		Linear		Lateral		Intermediate	
Gain	13	56	10	53	11	42	
Loss	7	30	4	21	13	50	
Same	3	14	5	26	2	8	

TABLE II.
Strength Changes Left Hand According to Body Build

A.		Linear		Lateral		Intermediate	
Gelatin Group (70 cases)	No. Cases	Pct.	No. Cases	Pct.	No. Cases	Pct.	
Gain	10	66	22	71	15	63	
Loss	4	27	7	24	8	33	
Same	1	7	2	5	1	4	
B. Control Group (68 cases)		Linear		Lateral		Intermediate	
Gain	10	46	9	49	14	54	
Loss	7	31	8	44	11	42	
Same	5	23	3	17	1	4	

above the mean, lateral; and those between these two, intermediate.

It will be seen in table I that the very small gains in strength of right hands in the gelatin group over the control group were about equally distributed between broad and slender built girls. Table II indicates a slight advantage for broad-built girls over slender-built ones in percentage of girls who gained strength in their left hands after gelatin feeding.

Table III has the most significant finding, in that 12 out of 15 linear type girls gained weight on addition of gelatin to their normal diets. The percentage of linear type girls who gained weight on gelatin was larger than for intermediate or lateral types of girls and much larger than for the control groups.

Because of the well-known and often lamented difficulty of helping very slender-built people to gain weight, the high proportion of success with gelatin in this study deserves comment.

The Council on Foods of the American Medical Association⁷ reported gelatin to be a wholesome food, well tolerated and readily digested, containing 85 to 90 per cent pure protein. Addition of gelatin to a normal diet increases the total proportion of protein as well as increasing the important amino acid, glycine. High protein has been shown to cause a consistent rise in metabolism by exerting a specific dynamic action according to Necheles and Mills.⁸

Beard⁹ reported increases in body weight of from 7 to 24 pounds in nine underweight people whose main complaints were anorexia, easy fatigability and nervousness by addition of amino acetic acid (glycine) to their diets. He had been unable to obtain increases in any of these cases by dietary measures without glycine. He reported further that the glycine caused disappearance of anorexia, fatigue and nervousness when weight was increased.

Anorexia, easy fatigability, high basal rates, nervousness and underweight have all been described as characteristic of linear type people. Perhaps slender-built peo-

TABLE III.
Weight Changes According to Body Build

A.		Linear		Lateral		Intermediate	
Gelatin Group (70 cases)	No. Cases	Pct.	No. Cases	Pct.	No. Cases	Pct.	
Gained Weight	12	80	18	58	13	54	
Lost Weight	2	13	5	16	9	37	
Maintained Wt.	1	7	8	26	2	9	
B. Control Group (68 cases)		Linear		Lateral		Intermediate	
Gained Weight	9	39	7	37	9	35	
Lost Weight	7	31	5	26	11	42	
Maintained Wt.	7	30	7	37	6	23	

ple need more protein than others because they use up so much maintaining their high basal rates.

Dr. McGuire¹² reported on the value of glycine in treating progressive muscular dystrophy and he said further "Glycine has been proved valuable not only as a therapeutic and diagnostic agent, but also in cases of 'vague fatigability', and 'chronic nervous exhaustion', neurotic cases, etc. It is possible, therefore, there is a relationship between the latter conditions and the myopathies."

CONCLUSIONS

1. In a control study, 70 college women on definite exercise schedules took gelatin for 28 days and were then compared with 70 others on the same schedules who did not take gelatin.
2. Very small gains in both weight and strength were made by the gelatin group and similar gains were not made by the matched control group.
3. The study failed to demonstrate significant changes in strength or endurance as a result of gelatin feeding.
4. When the role of body build was investigated, it was found that 12 out of 15 slender-built girls made significant weight gains on addition of gelatin to their normal diets.
5. Other girls matched for build and not on gelatin failed to make similar gains.
6. Slender-built girls on gelatin feeding made larger gains in weight than broader-built girls on gelatin feeding.

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Functional Lighting in College*

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ASSOCIATED with the consideration of student health is the very important topic of eye health. Because the student is compelled to spend many hours in classrooms concentrating upon lecture notes, writing boards or quiz papers, and night hours in study under abnormal eye comfort conditions, eye health will always be a division of student health of prime importance. The prevalence of eye defects and occupational eye defects is shown in Fig. 1 and Fig. 2. It will be noted that approximately 31 per cent of the youth group of college age suffer from near sightedness and that in the productive age group of the faculty (40 to 55 years of age) from 70 to 80 per cent have defective vision. It is apparent that every possible effort should be made to see that the individuals with defective vision have proper adjustments made and that every effort be made to provide conditions which will reduce eye strain to a minimum.

One of the first recommendations of the illuminating engineer is that the defective vision be corrected to as near normal as is possible under the existing circumstances. The conscientious engineer when consulted concerning modification of the installation of lighting systems first warns the client that little which is worth while can be accomplished to relieve those who have defective vision until that condition has been corrected. The illuminating engineer attempts to prescribe a lighting system which will not only prove adequate in quantity of light, but, what is more important, will have a quality which will produce seeing comfort. It is only because of the efficient and cheap light source which has been developed in the field of electrical engineering that the duty of designing lighting systems and prescribing lighting belongs to this branch of engineering. The need for an individual able to coördinate the knowledge of the physician and the engineer is urgent. Progress is being made at this time and it seems that the gap is being filled by a better understanding between the two professions in a common interest and that in the end each will understand the other's vocabularies and function jointly in making recommendations and prescribing lighting. It behooves the illuminating engineer to recommend a testing of the eyes, with accompanying corrections where needed. The physician should insist upon as strain-free seeing conditions as possible so that his prescription shall give the greatest comfort possible.

The lighting of the individual student study surface has been reduced to practically a package specification and there are available recommendations for school lighting which represent specifications for the minimum desirable conditions for a quantity and quality of lighting. In the lighting of the school it is impossible to specify

a package type of lighting for there are so many variables which must be considered as well as the economy of the installation, that it is necessary to study each individual case separately.

LIGHTING FOR THE COLLEGE

The American Recommended Practice of School Lighting as sponsored by the Illuminating Engineering Society and approved by the American Standards Committee¹ is the basis for the minimum specifications of school lighting dependent upon the difficulty of the task that must be performed. It is to be understood that this is a minimum specification, not what would be desirable if it were possible to meet the costs of the better installations. Since recommendations for lighting obey a geometrical law it would be well to double the specifications given if it is desired to obtain a comfortable seeing condition with the attendant lower amount of eye strain.

The above statement must be considered with an accompanying attention to the conditions of comfort. Unfortunately so much has been said and written concerning foot-candles that this one unit is often used as the sole basis for a specification. Nothing could be more dangerous. A simple example could be cited by considering an individual reading a newspaper under 10 foot-candles of light. It is possible for the eye to adapt itself to these conditions for a short period of time without serious disturbance. Now, without changing the illumination on the paper, a flash light beam may be directed into the eyes of the reader with the result that it will be impossible to read the print. The illumination on the paper has remained the same and there has been added to the eye much more illumination, but it has not only been ineffective in producing more comfortable seeing conditions for performing the task, but has actually made it impossible to perform the task. The changing of a lighting system or the specification of a new lighting system must not be undertaken through foot-candle change alone. An increase of foot-candles is desirable if the lighting quality is maintained, but meaningless if brightness conditions are such that eye strain is increased. The term brightness must be as fully appreciated as the term foot-candles, by the interested professions, before worthwhile progress can be made in increasing our foot-candle levels.

Within the range of the eye there must be no sources of excessive brightness nor must there be a brightness contrast of more than ten to one. It would be far better if the ratio were reduced to five to one if possible. Considering these ratios it will be seen that as the general brightness in the room increases the source brightness may also be increased. This fact allows of the specification of the brighter fluorescent sources in general lighting as compared to what would be specified with the enclosing glassware using the incandescent lamp.

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†Professor of electrical engineering, University of Illinois.

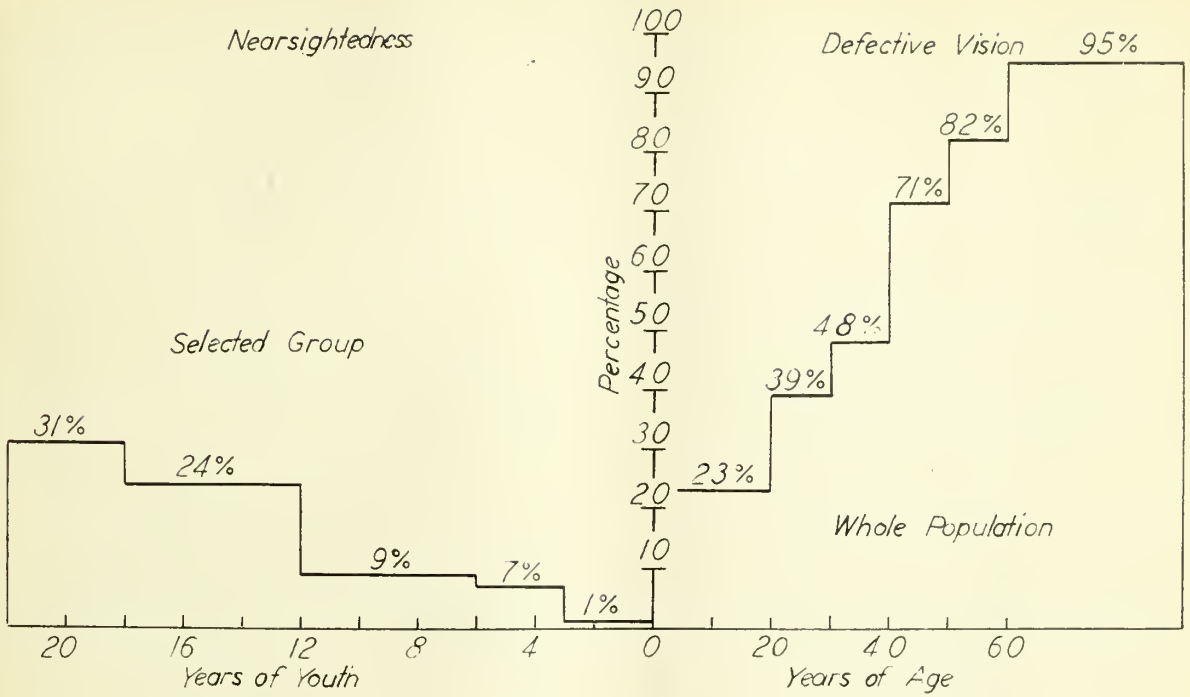


Fig. 1. Distribution of defective vision with age.

This holds true only where the fluorescent design leads to higher levels of illumination and not where fluorescent installations are used to replace incandescent lamps with the object of saving electrical energy. This new lamp is a tool making it possible to obtain higher levels of illumination with less radiant energy in the form of radiant heat at a wattage specification below that of a corresponding incandescent installation. As will be pointed out later, when dealing with this type of lighting specifically, these gains are not obtained without special financial considerations and without some undesirable features which must be considered upon their merits and not upon the enthusiastic sales arguments of an individual with a catalog and the fundamental urge of survival in a world of competition for a share of the school administration budget.

Though it has been pointed out before that each problem must be given consideration as an individual lighting task study, the desire of the general public and the school administration group for some yard stick by which to measure, would bring this general recommendation: where the class room is of average size with average ceiling height, proper coloration (ceiling approximately 75 per cent reflection factor and side walls with a 50 per cent reflection factor as a minimum), six 500 watt lamps properly spaced and controlled with indirect or semi-indirect equipment, will give satisfactory lighting for normal class room work. This work would normally consist of listening to lectures, reciting, making notes, and taking occasional quizzes, with confinement to close work never lasting over periods of

about an hour. Where the writing boards are used for demonstrations or recitation, there should be special provision for lighting these surfaces.

The above recommendation would not apply to sight saving rooms, drafting rooms, sewing rooms, libraries and other places where the tasks are prolonged and of the type that will produce severe eye strain if the correct lighting is not installed. The waste of nervous energy

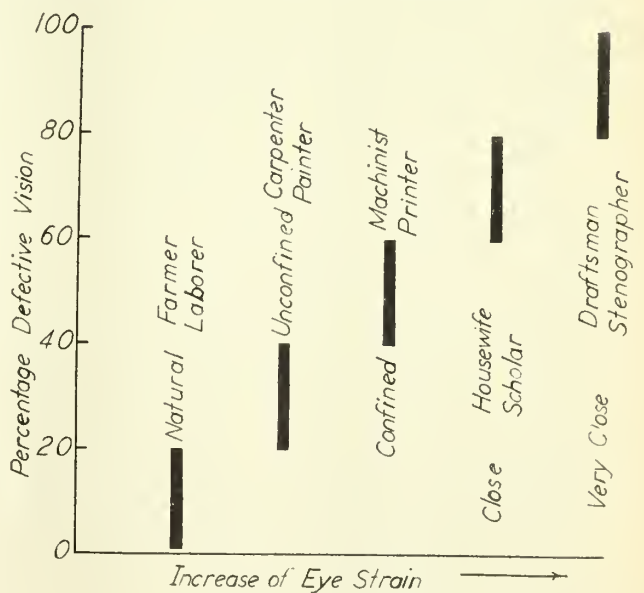


Fig. 2. Distribution of defective vision with occupation.

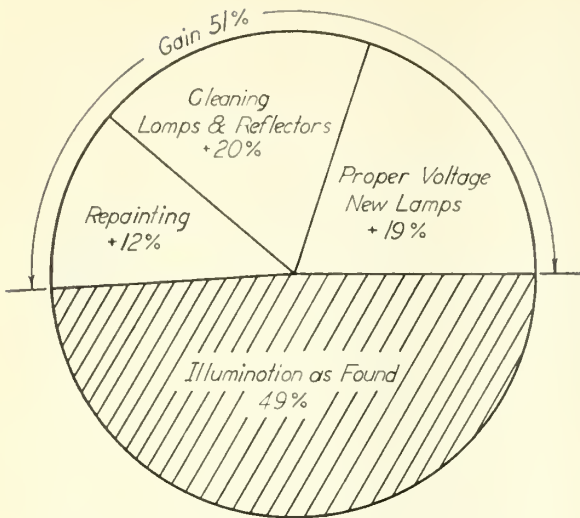


Fig. 3. Gain in illumination with proper maintenance.

through faulty eye sight and poor lighting is probably one of the most important questions for discussion in student health consideration that exists at the present time.

MAINTENANCE

Where lighting is not adequate there are some things that can be done to improve the situation even though it is impossible to install an adequate system. It is understood there is no substitute for the correct lighting system properly installed and maintained and that any compromise means doing the best that is possible. Though the improvement can not approach the perfect, as it is understood at the present time, there is no reason why any existing system should not be brought up to its highest level of light production. It has been observed that where systems have been improved, giving better lighting, it has always motivated the consideration of the improvement of other localities on the same campus and quite often the gain by maintenance has pointed out, in a physical way, the possible advantages of the better standards of lighting.

Figure 3 shows the compilation of the gains through maintenance which have been obtained under the average circumstances. In summary, the chart shows a net gain of 51 per cent when repainting, cleaning and adjusting of lamps and voltage are used for the utmost advantage with the system already installed. Repainting and cleaning should be part of any school maintenance program, and it requires only a judicial adjustment of systematic approach and timing to produce the maximum effect in improving the lighting. It is good economy to burn the proper lamp at the correct socket voltage and there can be some advantage in discarding a lamp before it has operated through its natural life. Though the complete maintenance program has caused an increase of 51 per cent, the result has been to produce more than double the illumination found when the room and the lighting system were renovated.

It is frequently found that the wiring capacity is so limited that it is impossible to obtain lamps to operate on the low voltage that exists at the socket or that the difference in voltage near the source and at the extreme end of the system is so great that a standard lamp placed at these positions would in one instance be overvoltage while at the other it would be operating at an undervoltage. There is little that can be done for a system of this type except to study the wiring and make such improvements as are necessary. There are now available smaller wires of higher capacity which may replace the existing wires allowing of a cheaper method of rejuvenating the obsolete system. Another argument being advanced is that the incandescent system may be replaced with fluorescent lamps. For comparable installation, about twice the lumens per watt may be obtained from these newer type lamps, however, where there is a marked deficiency in a wiring system, an improved lighting system, justified in bearing that name, would likewise require additional wiring. Where this is true, the choice of system will again depend upon an economical study of the various systems considered and the consideration of the heat produced by the system, this is particularly true where air conditioning is under consideration.

LIGHTING FOR THE CRITICAL TASK

Roughly the lighting in the college divides itself into two main types of lighting for seeing tasks. The general lighting has been discussed in a previous paragraph, the next problem to consider is the one for critical seeing. In the drafting room and the sewing room, for instance, a very severe task must be performed and the task is prolonged, for laboratory sections of this type are usually scheduled for three hour periods. In the library and at the study surface in the individual rooms the student may spend hours at close concentration upon poor printing, small type and his own hurriedly taken notes in the class room. Each of these tasks will produce at the best a severe strain upon the normal eye and upon those which have been corrected to as close to normal as possible. There should never be a compromise at these work positions, every effort should be made to make them as close to ideal as is economically and technically possible. Except for the student study desk there can be no general recommendations given as to what the final installation should be for each specific case is a study in itself and should be considered by some experienced individual who has in mind both the functional requirements and special means that are used in accomplishing the results that investigation and practice have shown are satisfactory.

For the student study surface, there has been developed what may be classed as a package recommendation. It represents the results of studies made by a committee of the Illuminating Engineering Society. The result of this committee's investigations led to the designing of an equipment known under the class specification of the I. E. S. Study Lamp. This lamp, positioned on a table where it can be located to remove the

reflected glare, properly lamped, in a room of normal student dormitory size, will provide adequate lighting for study for one individual. If possible there should be no compromise on an individual lamp for each student, because of positioning and freedom upon the work surface for locating books and writing materials. There have been some suggested arrangements² where it was impossible to finance the requirements for individual lamps for each student, but it must be remembered that this is a compromise and it was not the intent of the committee making the recommendations that more than one individual should use the lamp. This lamp is not a perfect device, but represents the best that can be obtained within a reasonable cost for the study lamp and its operation. The following is a suggested recommendation which seems to be as satisfactory as can be obtained in a progressive school considering lighting needs of the students, which at the same time represents requirements within the economical limits normally presented at the average college:

The window area, properly shaded, should be at least one-fifth of the floor area. Provisions for study lighting should not depend upon the general room lighting system unless it is of a totally indirect type. Each study position should be properly lighted with an approved lamp using a 100 watt incandescent lamp. The quality of work surface illumination should average between 15 and 25 foot candles of controlled light, free from both direct and reflected glare. Direct glare is eliminated by properly screening the source; a reflected glare, by providing work surfaces with a dull finish. Harsh shadows should not appear on the work surfaces and the illumination should be uniform (10 foot candles two feet from the lamp center line).

The room surface viewed should have 20 per cent of the work surface illumination, with the reflection factors for the ceiling and sidewalls at 75 and 50 per cent, respectively. The work surface should be at least 30 inches by 42 inches if a desk lamp is used, for it is necessary to locate the lamp properly to remove the reflected glare. For surfaces smaller than this, a floor lamp with filament not less than 60 inches above the floor level should be used in place of a desk lamp. Study lighting equipment should conform to the specifications of the Illuminating Engineering Society (I.E.S.) and should have the required certificate of approval attached when it is purchased.

When making a study of the drafting room, sewing room and library lighting, besides meeting the requirements for a high level of illumination (well controlled lighting of from 30 to 50 foot candles) specific attention must be paid to the quality of that lighting. The ideal is a totally indirect system regardless of the type of light source that is used. Such a system will be free from:

1. Direct glare, if care has been taken in distributing the light over the ceiling surface so as

not to produce high brightness contrast or high ceiling brightness.

2. Reflected glare, which will follow the same consideration as direct glare. Reflected glare will never exceed in brightness the initial specular source which produces it.
3. Shadows which are confusing and cause strain both from brightness contrast and multiple attention points causing confusion in the eye focusing.
4. Non-uniform lighting. The desirability of uniform lighting for a work surface is self-evident; but it does not conflict with the atmosphere of interest the architect wishes to create.
5. Differences of brightness between the work and the surroundings. The brightness contrast as mentioned should never exceed a ratio of ten to one.
6. Highly polished work surfaces, such as glass tops and varnished desk tops. The tendency is to use dark desk tops and this should be discouraged, for a top with a reflection factor of 20 or 25 per cent will prove more satisfactory, and work on a 30 per cent reflection surface at an illumination of 50 foot candles, is even more satisfactory. It is necessary to reduce the brightness contrast between the book and the surroundings to the limitations set above.

In making recommendations, it must be remembered that a large, low brightness, surface may be a source of irritation in itself by producing a glare effect when the student is exposed to the surface for a long period of time.

FLUORESCENT LIGHTING

In the preparation of this paper, the author has been asked to consider the latest arrival in the group of light sources, the fluorescent lamp. Much publicity has been given this light source and in many instances this type of lighting is being recommended by persons with only the most meager knowledge concerning the merits of the equipment in producing a lighting system for comfortable seeing. Often where the advisor recommends such a lighting system he is truthful concerning the statements made and the system when installed and properly maintained will be correct, but he fails to point out the relative cost as compared to the incandescent system and fails to call attention to the fact that the fluorescent lamp is not as simple and dependable as the incandescent lamp. In producing the fluorescent lamp it is impossible to obtain the uniformity of quality in color, light production and life as in the production of the incandescent lamp.

Where the problem is one of producing a specific color temperature, such as daylight, or the replacement of the old form of tubular light sources, there is little doubt but that with all its many inadequacies and some uncertainties, the fluorescent lamp is the correct solution. In the future, in our laboratories where color is important, and in art classes, it can be expected that daylight or

lamps of other color temperatures or color will be recommended. Because of the cheapness with which these lamps produce colored light as compared to other methods, the added inconvenience need not be given serious consideration. The result justifies the extra expenditure for auxiliary equipment and the special operating and maintenance problems which the fluorescent source introduces.

The specification of fluorescent lighting for general illumination in the libraries and class rooms of the college, and as has sometimes been recommended, for the dormitories, should be given detailed consideration with a complete study of the economics involved. Today the installations of this type are much more justified than they were a year ago. In fact it has been shown by reliable lamp manufacturers that from March 1939 to March 1940, a basic unit of fluorescent lighting when installed has been reduced in cost from \$6.71 to \$3.77, which is a reduction of 44 per cent based on the 1939 standard. The word "unit" includes the complete cost of lamp, auxiliaries and equipment with due consideration of the time interval of burning during lamp life.

In the following statements it may be that some will conclude that the author is opposed to the installation of fluorescent lighting in the college, but this is not the case, for the author has in several instances recommended this type of lighting in colleges, but only where the conditions justified the recommendation and it was pointed out to the client that the economical justification would be accompanied with several other difficulties, which are not present in an incandescent lighting system. As the lamp is developed and perfection is approached, as the cost of the lamp and auxiliary is reduced, there will be more reason for making recommendations for installations of fluorescent lighting to meet general lighting needs. Where a school is considering air-conditioning in particular, to meet the heat problem during summer school periods, it is recommended that considerable attention be given the fluorescent lamp.

The desire of the illuminating engineer is for more illumination and since a good portion of the energy which is delivered at the light source produces heat, his intentions are antagonistic to those of the ventilating engineer, who wishes to exclude all possible foreign heat. In rooms to be air-conditioned it is necessary to have the cooperation of the groups interested, if the lighting requirements are not to suffer.

There are two general rules that seem to prove true in most cases; it is not satisfactory to replace incandescent lighting by equipment which will give the existing foot-candles and it is seldom possible to replace incandescent lamps, watt for watt, with fluorescent lamps and obtain the lighting benefits which the new source makes possible. Therefore, since a good installation of fluorescent light should in the usual case require some rewiring it is well to balance the cost of this type of lighting against the cost of an incandescent system in making the study for recommendations in lighting improvement.

Since the usual sales approach for fluorescent lighting

is that more light is obtained from the same wattage, and this is true, the following items are included to consider the question "Does this mean more lighting for the dollars invested, and does it mean a system which will be satisfactory from the operation and maintenance standpoint?" Since to answer this question it is necessary to consider somewhat unrelated factors, these will be listed under numbered paragraphs.

1. *Is Daylight Quality of Light Necessary?*

Reports on the effect of color in light when considering daylight color temperature or even monochromatic light, have shown that there is no appreciable effect on the subject, regardless of the color of the light within the limits of illumination levels normally recommended for interior lighting. There are some psychological effects caused by the monochromatic lights of various colors but there seems to be a rapid adaptation by the individual to the colored light if there are no other light sources which can be used for comparison.

2. *Are there Factors which might discount the Reports of Unusual Gains in Foot-Candles?*

Where a reported installation shows a gain in illumination of more than double, after replacement of an incandescent system by fluorescent lighting, there are grounds for questions. If at the time of making the new installation, the wattage has been increased, the room has been reconditioned, and the lamps adjusted to the voltage, the gains through these changes cannot be credited as an advantage of the new light source.

During the first 100 hours of burning the fluorescent lamp has an output greater than that given by the rating, therefore, any reported improvement should be on measurements made after the lamp has been in operation at least a minimum of 100 hours.

The type of foot candle meter used may be of importance. The use of the barrier-layer cell in making light measurements will introduce an error in the report of true illumination gain, for this instrument is calibrated under a specific color temperature and some of the fluorescent lamps have different color temperatures or are off the black-body curve completely, which may cause the meter to read high unless it has a correction filter adjusting the meter reading to the true eye response curve.

3. *Is the Fluorescent Source of Low Brightness?*

Compared with the incandescent lamps of 300 and 500 watts which are usually used for general lighting in colleges, the fluorescent lamp is of relatively low brightness. However, comparing the brightness of the fluorescent lamp with that of the desirable brightness of the lighting equipment used in class rooms is another matter, for in this instance the fluorescent lamp is much the brighter. It is not desirable to install a lighting system using fluorescent lamps in the classroom where the eye is exposed to either the direct or the reflected glare from the lamp. The source brightness of the fluorescent lamp exceeds that recommended in the American Recommended Practice of School Lighting, which was estab-

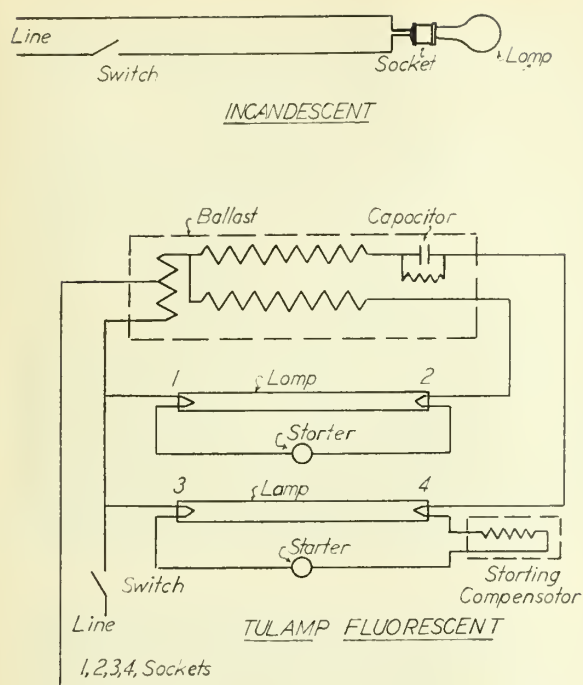


Fig. 4. Comparing the incandescent and tulamp fluorescent lamp with reference to the complicity of the auxiliary equipment.

lished for the minimum foot-candles listed in these recommendations. The information which is available indicates that if the illumination is increased the source brightness may be increased and a study of these principles may bring recommendations giving a foot-candle brightness specification instead of a fixed brightness value. However, it would be well to follow the recommendations for brightness values in schools until such a time as the Illuminating Engineering Society through its committee, recommends otherwise. This brightness limitation does not preclude the use of fluorescent lamps but does limit the type of equipment which may be installed and definitely excludes the placing of bare fluorescent lamps in any room which is being used for class or laboratory purposes.

4. *Is the Fluorescent Installation More Complicated than an Incandescent Lamp Installation?*

Figure 4 is used to aid in comparing the incandescent and a satisfactory fluorescent installation of equipment and wiring. There are current flow limiting devices, power factor correction principles, automatic switching and proper starting compensation provisions made in the fluorescent system, while the incandescent system is entirely free from any of the above mentioned auxiliary equipment. The whole fluorescent arrangement is a balanced system depending on adjusted parts and is more sensitive to voltage regulation and temperature for perfect operation. In the incandescent system improper voltage regulation means uneconomical and inefficient operation but does not preclude operation, while with the fluorescent lamp these same conditions not only cause the same effect on economy of operation but may cause

deterioration of the system and even preclude operation when carried to certain probable occurring limits.

5. *Is there a Hum?*

There will be a hum from the auxiliaries because to date the electrical engineer has not been able to design a ballast composed of iron and copper which will not hum. Is the hum objectionable? The answer to this question depends upon the reaction of the individual. If the units are built by a reliable manufacturer and are properly cushioned, in general it may be said that the level of hum is so low that the average individual will accept it as a background noise and will not be conscious of its presence.

If it is necessary to remove this hum completely it is possible to locate the ballasts outside of the room or at some central location in sound proof cabinets. This item must be considered in a design, for the location of the auxiliary equipment at points removed from the lamps requires more wire and a cabinet, both of which will increase the cost.

Where the teacher might be an individual irritated by the hum, there is a possibility of having the advantage of the lighting system nullified. If the teacher is irritated by the hum it is natural that the cause would be removed by turning out the lights, which defeats the whole purpose of the lighting design. Regardless of how well a class room is designed there is a need on the brightest day for artificial lighting at the inner row of seats farthest removed from the windows and on a dull day, it will be necessary to light the room completely with artificial lighting.

6. *Is there a Different Maintenance Problem for Fluorescent Lamps?*

The problem of care of the system is quite different. The incandescent lamp either functions or does not function and even if the lamp does not burn no damage is done by having the switch at the on position. The incandescent lamp lights immediately without a delay period and burns at what seems to the eye to be a uniform brightness.

The same is not true for the fluorescent lamp. It does not start immediately when the switch is placed in the on position. There is a period of preparation which the lamp passes through and during this relatively short period there may be some flicker. If the lamp or its auxiliaries do not operate correctly there is a likelihood of damage to the lamp or the auxiliaries and the failure to function with the switch in the on position may cause an expensive renewal unless the lamp is either cut off or immediately serviced. The first defeats the purpose for which the lighting system was installed and the latter is very difficult to obtain in the college or university.

There is another effect in which the gas in the lamps seems to be swirling. Though the lamp is operating at normal brightness the effect is the same as a flicker to the eye and will cause enough irritation that the lights may be turned off. It has been found that because of habit in having had experience with the quick action of



(a) In conjunction with direct lighting.



(b) In conjunction with semi-indirect lighting.

Fig. 5. Table type fluorescent lamps for library service.

the incandescent lamp, the initial flicker when the lamps are starting is very annoying to some individuals.

7. Concerning Stroboscopic Effect.

The first lamps were operated as single units from single phase electric lines. Since the gas conduction causing the glow in the tube, follows the change in current which passes twice through zero in a cycle, there is a definite extinguishing of the lamp. The same occurs in the incandescent lamp, but there is enough delay in the cooling of the filament that the eye carries over. The rapid and positive breaking of the continuity of light makes it possible to obtain several separate and distinct images of any moving object. This multiple image formation is very objectionable to one inclined to be

even slightly nervous. Because of the early lamps, the fluorescent lamp still carries the stigma of a first development. It is the practice today to install what is known as a *tulamp* unit, using two fluorescent lamps correctly connected so that the resultant effect is no more severe than that found with the incandescent. There are also many single lamp installations that are giving very satisfactory service. To make sure that there will be no unnecessary objection to the system it is well to forestall stroboscopic effects by using the latest lamp and auxiliary arrangements.

8. Will the Fluorescent Lamp give more Light for the Same Wattage?

The fluorescent lamp will give more lumens per watt than will the incandescent lamp, but not as much more

as is frequently credited to the lamp. It is fair and correct to include with the lamp wattage, the wattage of the auxiliary equipment when calculating the lumen output per watt for the lamp.

For general incandescent lighting the 300 watt and the 500 watt lamps represent the normal capacity that should be installed in designing proper school lighting. The table below compares the incandescent and fluorescent lamps.

Incandescent:

300-w— 5,900 lumens—19.7 lumens per watt.

500-w—10,000 lumens—20.0 lumens per watt.

White Fluorescent (Tulamp, 115 volts, including auxiliary loss):

40-w—2,100 lumens—36.5 lumens per watt.

Daylight Fluorescent —Tulamp, 115 volts, including auxiliary loss):

40-w—1,800 lumens—31.4 lumens per watt.

The values given are from recent publications but as the lamp is being improved there is an increase of efficiency. To replace the 500 watt lamp will take approximately five white fluorescent lamps, which, with the five auxiliaries, represent about 243 watts, or approximately half the wattage accompanied by a doubling of the lumens per watt. This gain is very much reduced on a dollar base when comparing the initial installation costs. It is this gain of light with less wattage which makes it mandatory that fluorescent systems be given consideration when designing or remodelling lighting for schools.

By installing a 230 volt system it would be possible to increase the capacity of the lighting system and improve the efficiency of the fluorescent system a few per cent more. In making any study of this new light source all computations should be made on the latest published data for the development of these sources is progressing so rapidly that current data become obsolete very rapidly.

The most recent lamp size added to this group is the 100-watt lamp, which has a slightly lower lumens per watt output than the 40-watt lamp but the total output is such that the number of lamps needed is reduced and the fixture costs will be reduced because fewer will be needed.

It is essential that the one specifying or requesting this new form of light source be informed about the above features when considering the lighting system. It is not logical to know only a portion of the story and try to draw conclusions from this limited information. The well designed fluorescent lamp system can give the same quality of lighting as can the well designed incandescent system. The fluorescent lamp has the advantage of giving considerably more light for the same wattage with some very undesirable operating conditions. In making a choice, all the factors involved must be evaluated and this is difficult because some of the problem deals with subjective factors rather than with the objective ones, which may be definitely evaluated. Experience with some of the installations now in service and being installed will permit of a more accurate eval-

uation of the subjective factors.

Figure 5 shows the use of auxiliary fluorescent lamps in a library. The general illumination is approximately 20 per cent of the table illumination. One room uses a well controlled direct system of general lighting, the other a semi-indirect system. Both of these installations have the approval of the library staff and the students. At the best, this type of lighting is a makeshift because it was necessary to increase the work surface illumination and it was impossible to supply adequate general lighting of the correct quality. A table type of library lighting should never be installed in planning a new building. Correct library lighting is a comfortable system of general lighting which will give adequate illumination.

SUMMARY

The question of eye health in the college is so closely linked with the lighting of the task which must be performed that it is impossible to separate the two. The two professions interested in the correct solution of the lighting requirements are performers of very different training and point of view. To obtain data to determine the satisfactory type of lighting and amount of illumination will require the coöperation of both the medical and engineering professions. This coöperation must be built upon the mutual respect of each profession for the ability of the other and a maturing of each profession in the requirements which must and can be met in specifying a lighting installation. When this has been accomplished and both professions place their proven claims before the college administration, the group responsible for the operation and policy of the college will have to give more attention to the sadly neglected problem of providing adequate and correct functional lighting where study and laboratory work is the daily and nightly task.

There is another group of individuals, the profession of architecture, that must be considered and who may prove a major hindrance if their problems are not considered and their coöperation sought. This group is trained in producing the desirable atmosphere with the materials at hand and this is often a very difficult task when funds are limited. It will be found that proper sympathy with the solutions of their problem will permit of a fitting of a lighting design into the atmosphere sought by the architect without either group having to make more than minor adjustments in their original ideas.

It is essential that these professions agree upon methods of procedure and upon what will be a pleasant and satisfactory lighting system, and if they will coöperate in educating the student to demand good lighting and the administration to the necessity for good lighting, there will soon be considerable impetus to a movement which has slowly been gaining momentum and which has grown under a slogan which combines better sight with better lighting.

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MINNEAPOLIS, MINN., DECEMBER, 1941

ANOTHER YEAR

Another year in the life of JOURNAL-LANCET comes to a close with this issue. It is of interest to read the index which begins on page 500. A large number of authors and subjects is listed. It is also interesting to note that eighteen of the states have contributed articles during this year, namely: California, Connecticut, Illinois, Iowa, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, South Dakota, and Wisconsin. Papers by authors from the District of Columbia, Puerto Rico, and China, have also been published. Each month the JOURNAL-LANCET reaches the desks of subscribers in forty-three states and several foreign countries. Through the year it has been the desire of the Editorial Board to afford its authors and readers an accurate and readable journal in which to publish and obtain latest medical knowledge.

J. A. M.

DECEMBER COLDS

This is a great month, even though thermometers go down and fuel bills go up. The weather is crisp and bracing, and those who enjoy good health get a great kick out of it. We call it stimulating, but this, of course, applies only to those who can react favorably to the nip in the air. Acute colds, rhinopharyngitis, and upper respiratory infections are to be expected in those whose vitality is low. We know that a combination of various micro-organisms are guilty of producing these disorders, but, like cocktails, the mixtures often differ according to time and place. Scarcely has a study of the prevailing types in a certain epidemic in a given locality been completed when it is found that like a turn of the kaleidoscope the combination has changed.

Our lay friends do not understand the diversity and complexity of these microbic groupings and are naturally somewhat impatient that medical progress should appear to be so slow in finding a specific for this common ail-

ment. Physicians, to be sure, use the term "acute cold," but they do not really consider the term a diagnosis any more than they do the term "fever". There are many kinds of fevers, and some day we shall no doubt be able to classify and name many colds according to the predominant factors entering into the make-up of the infection-cocktail in a given case. When that has been accomplished, empiricism and shot-gun prescriptions so often resorted to now will be relegated to the past.

A. E. H.

THE TUBERCULOSIS CHRISTMAS SEAL AND THE TUBERCULIN TEST

The gross income from the sale of tuberculosis Christmas seals has averaged about \$5,000,000 for the past few years and may reach \$6,000,000 or \$7,000,000 this year. The funds in the past have been used largely for educational purposes. Publication and distribution of pamphlets, articles in magazines and newspapers, public addresses, victrola records, radio broadcasts, exhibits, etc., have done much to call the attention of the citizens of various parts of the world to the seriousness of tuberculosis as a destroyer of health and life.

Recently funds derived from the seal sale have been used for the tuberculin test, one of the finest educational activities in which the National Tuberculosis Association and its component organizations have ever engaged.

There is no test whose specificity has been so definitely proved and so extensively used for any disease in both animals and man. Our veterinarians have administered more than 230,000,000 tests to cattle. Postmortem examinations of the carcasses of almost 4,000,000 reactors, as well as large numbers of non-reactors, have provided irrefutable evidence for the specificity of the test.

The tuberculin reaction indicates that living tubercle bacilli are present. This, in turn, indicates that the reactor has been exposed to a contagious case of tuberculosis; therefore, as an epidemiological agent the tuberculin test has no equal; it immediately establishes a trail which may often be followed to the contagious case. Only the tubercle bacillus causes clinical tuberculosis and, therefore, every reactor to tuberculin is a potential case of this form of the disease. Thus, the test places the reactor and those interested in his health on guard. He should be examined at once, since clinical tuberculosis may already be present in some part of his body; if not he should be examined periodically for this disease may appear at any subsequent time. Thus, through the information obtained from the tuberculin test the individual's as well as the community's interest is elicited. It is a well established fact in pedagogy that the best time to educate is when the individual is personally interested in a subject.

There have been a few attempts to condemn and discredit the tuberculin test because it occasionally fails. The greatest error that has been made is to make X-ray film inspections of the chests of both reactors and non-

reactors and regard the presence or absence of densities on the film as more significant than the tuberculin reaction. In some groups there have been reported as many such shadows on the films of chests of non-reactors as reactors. From such findings the sweeping conclusion has been drawn that the tuberculin test failed. To do this is to totally ignore the fact that the etiological agent is microscopic, whereas, the X-ray reveals only the shadows of gross lesions. Other diseases such as abscess, unresolved pneumonia, malignancies, and fungus disease, cast shadows on the X-ray film not unlike those cast by tuberculosis. The presence of dense, sharply outlined shadows on X-ray films have been interpreted as representing only primary tuberculosis, despite the fact that pathologists have proved that calcifications in the lungs may be the result of several non-tuberculous conditions.

Frimann-Dahl and Waaler¹ made X-ray film inspections of the chests of 200 persons who had non-tuberculous fatal conditions. In 48 of these cases which had X-ray shadows usually interpreted as representing calcifications, etc., due to tuberculosis, the postmortem examination revealed that the ossifications, calcifications, and thickened pleura were wholly non-tuberculous and were due to such causes as foreign bodies, calcified emboli and thrombi, and ossifications between the alveoli.

Such workers as Farness,² and Cox and Smith³ have shown that coccidioidomycosis frequently causes calcifications in the lung parenchyma and hilum region, which cast shadows on the X-ray film which can not possibly be differentiated from those cast by tuberculous lesions.

Dr. Byron J. Olson et al⁴ recently reported on an excellent study, concluding that: "The finding of pulmonary calcification, particularly in tuberculin-negative individuals, should not be assumed to be evidence of infection with tuberculosis." They suspect *Ascaris* as a possible cause of pulmonary calcifications.

All attempts to condemn the tuberculin test have fallen or must fall with a dull thud because they do not coincide with established fundamental principles. Thus, the program of the National Tuberculosis Association, or any other organization or individual promoting tuberculin testing deserves support not only because it has a splendid educational value, but also because the test is the first step in an investigation for tuberculosis in an individual or a community.

J. A. M.

REFERENCES

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2. Farness, O. J.: Coccidioidomycosis, "Diseases of the Chest Including the Heart"; Springfield: Charles C. Thomas (ready for publication).
3. Cox, Alvin J., and Smith, Charles Edward: Arrested Pulmonary Coccidioidal Granuloma, *Archives of Pathology* 27:717, (April) 1939.
4. Olson, Byron J., Wright, W. H., and Nolan, M. O.: An Epidemiological Study of Calcified Pulmonary Lesions in an Ohio County, *Public Health Reports*, U. S. P.H.S. 56:2105, (Oct. 31) 1941.

Book Reviews

Gould's Medical Dictionary: Words and Phrases Generally Used in Medicine and the Allied Sciences, with their Pronunciation and Derivation; edited by C. V. BROWNLOW; fifth revised edition, blue fabrikoid, gold-stamped, 1528 pages, 174 tables, many illustrations in color; Philadelphia, The Blakiston Company, \$7.50 with thumb index or \$7.00 plain.

The late George Milbry Gould (1847-1922) was a great medical editor and a medical lexicographer whose varied talents probably were unparalleled in his time. He was a man to whom the American medical profession owes much, for it can be said that in the Nineteenth Century he worked almost alone in striving incessantly to prise American medical literature free of its turgid, inaccurate, often colloquial and usually ambiguous verbiage. His stature as an eminent figure in one branch of American medicine has not been sufficiently recognized.

The new fifth edition of his famous medical dictionary is in some measure a remembrance of the departed man: since it is at once both useful and authoritative, it is in this special sense more desirable than any memorial in bronze or marble. Published on August 20, 1941, it is the most recent work of its kind available in this country. Such immediately new words as "sulfamethylthiazole," "gramacidin" and "coumarin" are defined; and the admirable table of pathogenic bacteria compiled by Dr. D. H. Bergey is supplemented by another classification of infestations caused by the metazoa (phyla Platyhelminthes and Coelhelminthes), by the same worker. Valuable to any physician who writes, as well as to the professional medical editor, is the table of doses contributed by Dr. Wilbur L. Scoville, author of *The Art of Compounding*. The key to pronunciation, a consideration which has been inexplicably neglected in some medical dictionaries, is readily understood: "Letters have the sounds of the English alphabet. Vowels are short when followed by a consonant within the syllable, otherwise long. A macron shows when this rule is reversed."

The book should be a salient tool in the service of anyone who proposes either to add to the great volume of medical literature or to understand more fully that part of the existing literature which time permits him to examine.

A Textbook of Histology, by HARVEY ERNEST JORDAN, A. M., Ph.D.; blue cloth, gold-stamped, 651 pages plus references and index, 609 illustrations with some in color; New York, D. Appleton-Century Co., 1940. Price \$7.00.

The student who approaches histology or any of the other basic sciences for the first time is in need of every piece of fundamental knowledge he can get, however inconsequential such pieces of fact may seem to him later. It is probable that most workers in the so-called laboratory branches of medicine would recall that the plain, workaday instructions of the beginner's manual plus constant observation in the laboratory were worth much more to them than any formal textbook could be.

The author of this text, who is professor of anatomy in the University of Virginia, has not assumed that the reader who is to use it knows too much. This is an excellent beginning.

From the primary chapter on protoplasm and the individual cell (considered generally), the author proceeds to tissue proper, well defined as "a collection of similarly specialized cells united in the performance of a particular function, e. g., liver tissue." Connective tissue and bone are next presented and are followed by muscular tissue and nervous tissue. Hematology is included, as are the teeth, dermal appendages, and the histologic aspects of the most important organs. Embryology of necessity is considered as is also physiology, to a limited extent.

It is interesting to notice that some of the references are to anatomic periodicals in issues of as recent as three months within the date of publication of this book. As a matter of fact, the *American Journal of Anatomy* and the *Anatomical Record* served as bases for the inclusion of new material in this eighth edition of Dr. Jordan's text, and if it be accepted that most recent additions to American histologic knowledge are printed in these two journals, it will be seen that revision in this instance has been thorough and comprehensive.

The Vitamin Content of Meat, by HARRY WAISMAN, Ph.D., Research Associate in Biochemistry, University of Wisconsin, and C. A. ELVEHJEM, Ph.D., Professor of Biochemistry, University of Wisconsin. Minneapolis, Minn., Burgess Publishing Co., 1941. Price \$3.00.

For the past five years, the Department of Biochemistry at the University of Wisconsin has been engaged in detailed investigation concerning the distribution of vitamin B₁ in animal tissues, and the riboflavin, nicotinic acid, pantothenic acid and pyridoxine content of meats. While investigations of food in years past were necessarily limited by inadequate quantitative methods, the availability of new methods of investigation has made it possible to study meat not only as a source of protein, phosphorus and iron, but also as an important source of vitamins. Recognizing the importance of increased knowledge of nutrition to national health as well as to national defense, Drs. Elvehjem and Waisman have provided a comprehensive, 209-page mimeographed volume to summarize the available information on the value of meat and meat products. The authors make no pretense that, although their extensive material, including comprehensive bibliographies and references, is presented in book form, that there is any finality about their data. The entire subject is still in the dynamic stage and much work is still to be done before definitely reliable figures can be presented. Nevertheless, they have reviewed an extensive literature in a critical manner and tested it against results which have been obtained in their own laboratory investigations. As a result, they have produced a volume clear, concise and well-organized, which includes as much positive information concerning nutritive value of meat that could possibly be reliably collected at this time.

Their investigations and conclusions concern vitamins A, B, E, K, C and the following members of the B complex: thiamine, riboflavin, nicotinic acid, pyridoxine, pantothenic acid, and additional factors. They have also given data for the preparation of samples for vitamin analysis and methods for proximate analysis of vitamins in animal tissues. In fine, they have produced a volume of which they may well be proud and to which any workers in the field may turn with confidence.

Regional Diagnosis of Lesions of the Brain and Spinal Cord, by BING and HAYMAKER; 11th edition, 275 pages; St. Louis, The C. V. Mosby Company. Price \$5.00.

A short time ago the reviewer had the privilege of presenting a summary of Bing and Haymaker's book of *Nervous Diseases*. This present review deals with the small companion book which is now in its eleventh edition, a rather unusual thing in medical texts of the present day. Within its pages may be found the essence of all that is necessary to accurately localize cerebral and spinal lesions, and while its greatest usefulness is undoubtedly adapted to those doing special work in this field, general practitioners, particularly those far away from neurologic consultation, will find it very useful.

Future Meetings

PRELIMINARY PROGRAM

The Twenty-Second Annual Meeting of the AMERICAN STUDENT HEALTH ASSOCIATION

Hotel New Yorker, New York City
December 30 and 31, 1941

TUESDAY, DECEMBER 30

Morning Session

- 9:30 REGISTRATION.
- 10:00 GENERAL SESSION.
Call to order by the President.
President's Address—Dr. Ruth E. Boynton.
Vision Facts for Vision Reasons—Dr. Hedwig S. Kuhn.
Physiotherapy—Speaker to be announced.
Determining Health Needs of Students—Louis M. Heil.
- 12:30 ASSOCIATION LUNCHEON.
The College Health Program and National Defense—Dr. L. G. Rowntree, Medical Director, Selective Service.

Afternoon Session

- 2:00—3:00 GENERAL SESSION.
Business Meeting.
Secretary's Report.
Reports of Chairmen of Standing Committees.
Appointment of Nominating Committee.
- 3:00—4:15 ROUND TABLE SESSIONS.
Committee on Health Service—The Use of Statistics in Forming a Health Picture of the College Age Group.
Committee on Hygiene of Physical Activities—The Problems of the Physically Low Grade Student.
- 4:30—6:00 *National Health Library*—TEA.
- 6:30 COUNCIL DINNER.

WEDNESDAY, DECEMBER 31

Morning Session

- 9:00—9:30 BUSINESS SESSION.
Report of Nominating Committee.
Report of Council Meeting.
Inventory of College Personnel Resources in Health Education—Louise Strachan.

9:30—11:00 ROUND TABLE SESSIONS.

Committee on Organization and Administration
—What are Health Services Contributing
Toward National Defense.

11:00—12:30 Committee on Informational Hygiene—
Testing as a Means of Evaluating Health
Information of College Students.

Committee on Health Problems of College
Women—Effect of Minor Physical Defects
upon Physical and Mental Health.

12:30 TUBERCULOSIS COMMITTEE
LUNCHEON.

Tuberculosis Case Finding in Colleges—Dr.
Robert E. Plunkett.

12:30 COUNCIL LUNCHEON.

Afternoon Session

- 2:30 GENERAL SESSION.
Student Conservation of Hearing—Dr. Edmund P. Fowler, Jr.
Incoördination and States of Tension—Dr. Smiley Blanton.
Nutrition Problems among College Students—
Dr. John J. Boehrer.
Mental Hygiene—Dr. Helen Langner.

EXHIBITS by: Committee on Eye Health.
Committee on Tuberculosis.
Committee on Ear Health.

Five postgraduate courses in obstetrics, each of four weeks duration, will be offered at the Chicago Lying-in Hospital between January 12 and June 6, 1942. These are sponsored by the Illinois State Department of Health and the Children's Bureau of the U. S. Department of Labor. The features of the program consist of observations on current managements of normal and abnormal states of the pregnant, parturient, and puerperal patient. Lectures, demonstrations, clinics, and other teaching means augment the operating room and birth room observations, and ward round discourses. The course is run on a non-profit basis. A deposit of \$25.00 is required on registration, \$10.00 of which is refunded at the completion of the course. All the members of the department participate in giving the courses. Additional information and application blanks may be obtained by request from: Postgraduate Course, Department of Obstetrics and Gynecology, 5848 Drexel Avenue, Chicago, Illinois.

News Items

Dr. Edwin J. Simons, Swanville, Minnesota, has been appointed head of the medical unit of the Minnesota division of social welfare on a part-time basis, effective January 1. He succeeds Dr. Herman E. Hilleboe, chief of the unit, who will report January 1 to the United States Public Health Service in Washington to undertake public health work in connection with defense activities. The announcement was made by Walter W. Finke, state social welfare director.

Dr. Cedric Northrop, superintendent of the State Tuberculosis Sanatorium at San Haven, North Dakota, has resigned effective December 1, to become director of tuberculosis control in the state health department at Seattle, Washington.

Dr. J. de J. Pemberton was elected president of the staff of the Mayo Clinic at the annual dinner meeting recently. He succeeds Dr. F. W. Gaarde. Dr. F. J. Heck was named secretary.

The fall meeting of the North Dakota Society of Obstetrics and Gynecology was held in the Gardner hotel, Fargo, November 15. Speakers included: Dr. Norman Kretzschmar, University of Michigan; Dr. A. B. Hunt, Mayo Clinic; Dr. J. R. Conrad, Jamestown; and Dr. Charles Darner, Fargo.

St. John's and St. Peter's hospitals as well as the Veteran's hospital at Fort Harrison, Montana, have been placed on the approved list of the American College of Surgeons.

Dr. D. L. Kegaries, Rapid City, is the new president of the Black Hills Medical society. Other officers are: Dr. W. L. Matlock, Deadwood, vice president; Dr. J. D. Bailey, Rapid City, secretary-treasurer; and Dr. M. O. Pemberton, Deadwood, censor.

Dr. P. W. Brown, Rochester, Minnesota, has been elected president of the Olmsted-Houston-Fillmore-Dodge County Medical society. He succeeds Dr. B. E. Hempstead. Dr. J. P. Nehring, Preston, is vice president and Dr. M. J. Anderson, secretary.

Dr. A. C. Merriam has moved into his new bungalow office in Monticello, Minnesota.

Dr. C. F. Young, Larimore, was elected president of the North Dakota School Officers' association at the annual meeting of the organization held in Minot recently.

Dr. D. C. Rhines, Caledonia, Minnesota, has retired from active medical practice and is now living in Owatonna. One of the oldest practitioners in the Northwest, Dr. Rhines had resided in Caledonia for 42 years.

Dr. Willis L. Herbert, formerly of Granite Falls, has opened offices in Columbia Heights, Minnesota.

Dr. Lloyd T. Sussex, formerly of Havre, Montana, officer with the naval reserve at Bremerton, Washington, has been made chief of surgery at the Bremerton Naval hospital.

Dr. L. H. Landry, Walhalla, North Dakota, is the new chief of staff for Mercy hospital. He succeeds the late Dr. W. W. McQueen.

Dr. S. A. Slater, Worthington, was re-elected president of the Minnesota Public Health association for the fifth consecutive term at the annual meeting of the organization held in St. Paul November 7. Four new directors were also elected. They are: Dr. P. C. Welton, Wabasha; Dr. Karl H. Pfuetz, Cannon Falls; Nels M. Engen, Warren; and Dr. Henry C. Domo, Slayton.

Dr. Maysil Williams, Bismarck, head of the North Dakota State Health Department, reported on the survey of the recent epidemic of encephalitis, at the meeting of the Devils Lake District Medical society recently.

Dr. G. C. Strauss, formerly of Grand Marais, Minnesota, is now in Biwabik, Minnesota, where he is assistant to Dr. Robert Bray at the Biwabik hospital.

Dr. H. C. Durkee, physician of Faith, South Dakota, for thirty-one years, is now practicing in Little Rock, Iowa.

The Fourth Annual Forum on Allergy will be held in Detroit, Michigan, January 10 and 11, 1942.

Dr. R. C. Hottinger, for the past 10 years a physician at Janesville, Minnesota, has been called to Fort George Wright for active service as a first lieutenant in the medical corps of the Army.

Dr. William A. O'Brien, Director of Postgraduate Medical Education, Medical School, University of Minnesota, speaks over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth, at 10:45 o'clock every Saturday morning. The broadcasts are sponsored by the Minnesota State Medical association. Dates and subjects for this month are as follows: Dec. 6—Coronary Disease; Dec. 13—High Blood Pressure; Dec. 20—Rheumatic Heart Disease; Dec. 27—Gingivitis.

Dr. G. S. Ahern has become associated with the Quain and Ramstad clinic in Bismarck, North Dakota. He will serve as resident physician in surgery at the Bismarck hospital. Dr. Ahern received his medical degree from the University of Minnesota in 1939. He completed his internship at the Minneapolis general hospital in June, 1941. Since then he has been with the Tyler clinic at Tyler, Minnesota.

The American Urological Association offers an annual award "not to exceed \$500" for an essay (or essays) on the result of some specific clinical or laboratory research in Urology. The amount of the prize is based on the merits of the work presented, and if the committee on Scientific Research deem none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years. Essays should be in the hands of the secretary, Dr. Clyde L. Deming, 789 Howard Avenue, New Haven, Connecticut, on or before April 1, 1942.

(Continued on page 506)





41B 172



