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The Canadian Practitioner and Review

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Index to Volume XXXV

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Editorials

	Page		Page
American Association of Obstetricians and Gynecologists	664	City Council and the Medical Profession	747
Anglo-Saxon Consolidation	253	Crippen Case, The	661
Annual Meeting of the Academy of Medicine	386	Dangers of Football, The	61
Athletic Death	185	Deaf Child, The	659
Automobiles for Doctors	317	Doctor Sheard as Medical Health Officer	256
Baby Show at Toronto Exhibition	662	Doctor Louis Wickham and Radium	742
Brain Tumors and Optic Neuritis	109	Filtration Plant in Toronto	314
British Medical Association	60	Florence Nightingale	445
Canadian Government Annuities Scheme, The	524	Florence Nightingale	585
Canadian Hospital Association	190	Fresh Air and Health	59
Canadian Medical Act, The	313	General Hospital Ex-House Surgeons' Annual Meeting and Banquet	260
Canadian Medical Association	185	Hospital for the Feeble-Minded in Orillia	660
Canadian Medical Association	312	Hospital for Sick Children	315
Canadian Medical Association	440	Hydrophobia	57
Care of the Epileptics, The	313		

	Page		Page
International American Congress of Medicine and Hygiene, Buenos Aires, Argentine Republic	111	Parent and Doctor	386
King's Death, The	385	Prevention of Tuberculosis, The	58
King Edward VII.	442	Princely Gift, A	261
King George the Fifth	444	Recent Asylum Appointments	746
Medical Education in Vienna	748	Resignation of Dr. Sheard	742
Medical Profession in France, The	258	Results of the Examination, College of Physicians and Surgeons of Onta- rio	537
Meeting of the Ontario Medical Coun- cil, The	540	Retirement of Miss Snively, The	56
Methods of Teaching in Medical Col- leges	108	Royal Births in England	257
New General Hospital in Toronto	110	School Census for New York, A	188
New General Hospital, The	745	Toronto General Hospital Ex-House Banquet	191
New Hospital, The	316	Treatment of Feeble-Minded People ..	664
New Medical Health Officer of Toronto	743	Typhoid Fever	584
Notes. 62, 112, 113, 318, 319, 542, 592, 668,	669	Undesirable Immigrants	663
Nurses in Hospitals for Insane	443	University of Toronto	315
Ontario Medical Council	54	Vagaries of Fibromyomatous Tumors, The	584
Ontario Medical Council	257	Water Supply of Toronto, The	189
Ontario Medical Council	591	Western Medical Federation	55
Ontario Medical Council	666	Western University ..	259
Ontario Medical Library, The	316		

Obituaries

	Page		Page
— Canniff, William, M.D., M.R.C.S.	751	Newell, Leslie, M.D.	263
— Cleland, Gawn Shaw, M.D.	118	Ogden, Uzziel, M.D.	116
— Cochrane, James M., M.D.	115	Piper, John Mill, M.D.	193
DeWolf, Oscar C., M.D.	469	Richardson, James Henry, M.D.	119
Downey, William Stewart, M.D.	467	Robb, Mrs. Hunter	321
Drake William Howell, M.D.	671	Sawdon, James Edgar, M.D.	671
Graham, William Henry, M.D.	469	Secord, Solomon, M.D.	390
Hackett, William Alexander, M.B.	467	Simpson, George Reid, M.B.	322
Hyaman, Garnet Patrick, M.D.	122	Sinclair, Daniel Archibald, M.B.	751
Jewett, Charles, M.D.	594	Snider, Rufus O., M.D.	672
Johnstone, James K., M.D.	594	Thompson, James E., M.D.	672
Kassabian, Mihran K., M.D.	548	Totten, Osborne, M.D.	321
Kerr, Bernard S., M.D.	321	Traub, John Emil, M.D.	122
Koch Robert, M.D.	470	Wilson, Herbert Charles, M.D.	64
Mallory, Charles Norton, M.D.	263	Wilson, John Dolway, M.D.	390
Mullin, John, M.D.	594	Wood, Isaac, M.D.	671
McCarthy, James Moyston, M.D.	672		
McIntyre, George C., M.D.	321		

Book Reviews

	Page		Page
Anatomy, Descriptive and Applied, by Henry Gray	752	Epitome of Diseases of Woman, An, by Charles Gardner Child	65
Cancer of the Womb, by Frederick John McCann	195	Functional Nervous Disorders in Child- hood, by Leonard G. Guthrie	195
Congenital Dislocation of the Hip, by J. Jackson Clarke	595	Gray's Anatomy	597
Diagnostic Therapeutics, by Albert Abrams	753	Handbook of Diseases of the Ear, by Richard Lake	392
Diseases of the Colon and their Sur- gical Treatment, by P. Lockhart Mummery	596	Heart Disease, Blood-Pressure and the Nauheim-Schott Treatment, by Louis Fangeres Bishop	674
Diseases of the Heart and Aorta, by Arthur Douglas Hirschfelder	595	Heart Disease and Thoracic Aneurism, by F. J. Poynton	196
Diseases of the Larynx, by Harold Barwell	268	High Frequency, Electric Currents in Medicine and Dentistry, by S. H. Monell	265
Diseases of the Nose, Ear and Throat, by William Lincoln Ballinger	126	High Frequency, Electrical Currents in Medicine and Dentistry, by S. E. Monell	392
Diseases of the Nose, Mouth, Pharynx and Larynx, by Alfred Brösk	673		
Diseases of the Skin, by Alfred Schalek	595		

	Page		Page
Insanity in Every-Day Practice, by E. G. Younger	549	Practical Treatise on Diseases of the Skin, A, by James Nevins Hyde ..	391
International Clinics, by W. T. Longcope	196	Practitioners' Visiting List for 1910 ..	65
International Clinics, by Henry W. Cattell	597	Prescriber, The	753
Macs of '37, The, by Price-Brown	675	Prevention and Treatment of Abortion, by Frederick J. Taussing	266
Manual of Diseases of the Eye	392	Principles of Pathology, The, by J. George Adam	472
Manual of Midwifery, A, by Henry J. Jillett	266	Production and Handling of Clean Milk, The, by Kenelm Winslow	266
Manual of Venereal Diseases, by Officers of the Royal Army Medical Corps	194	Progressive Medicine, by Hobart A. Hare	66
Minor and Operative Surgery, by Henry R. Wharton	472	Progressive Medicine, by Hobart A. Hare	265
Modern Medicine, Its Theory and Practice, by William Osler	549	Pulmonary Tuberculosis and Sanatorium Treatment, by C. Muthu	128
Morphia Habit and its Voluntary Renunciation, by Oscar Jennings ...	128	Skin Affections of Childhood, The	195
New and Non-Official Remedies, by Press of American Medical Association ..	391	Surgical Diagnosis, by Edward Martin	264
Operations of General Practice, by Edred M. Corner	194	Surgical Emergencies, by Percy Sargent ..	195
Practical Anesthetics, by Edmund G. Boyle	194	Text-book of Pharmacology and Therapeutics, by Arthur R. Cushney ...	673
Practical Guide to the Newer Remedies, by J. M. Fortescue-Brickdale	752	Treatise on the Principles and Practice of Medicine, by Arthur R. Edwards, M.D.	127
		Text-book of Surgery, by George Emerson Brewer	65
		Treatment of Disease in Children, The, by G. A. Sutherland	194

Articles

	Page		Page
Abdominal Surgery, Use of Oil in ...	479	Calcium Lactate in Post-Partum Hemorrhage ..	409
Abortion, Justifiable	620	Cambridge's Reaction in Cases of Ulcer of the Duodenum	525
Acute Coryza	716	Canadian Medical Association, The ...	447
Acute Poliomyelitis	325	Canadian Training School for Nurses..	23
Adductor Reflex, The	649	Carcinoma of the Stomach	647
Adenoids and Nocturnal Enuresis ...	106	Cardiac Dropsy Relieved by Digipuratum and Diuretin	395
Adenoids, Removal of	526	Cardiac Murmurs, Common Types of Functional	481
Aesculapian Club President's Address	78	Cardiac Neuroses	685
After-care of a Bad Cold	689	Cardiac Syphilis	649
Alcohol, Action of, Upon the Human System	612	Case of Death on the Operating Table	528
American Serums Abroad	617	Case of Excision of the Entire Tongue with its Results	527
Anatomical and Clinical Relations of Meckel's Ganglion to the Nose and Its Accessory Sinuses	173	Central Origin of Some Cases of So-called Heart Block	732
Anaesthetization, Jonnesco Method of.	129	Cerebral Haemorrhages at Birth with Operation	104
Angina Pectoris	254	Cerebellar Tumor, Operation for	740
Ankylosis, Treatment of, with Fibrinolysin	100	Caesarean Section in Placenta Praevia.	181
Antitoxin, Treatment of Diphtheria ...	688	Changes Induced in the Blood of Rabbits by Living in an Atmosphere of Water Gas	373
Antithyroidin in Exophthalmic Goitre.	103	Changes in the Personnel of the Medical Faculty at the University of Pennsylvania ..	546
Appendicitis in Children	416	Chemistry of Urine in Pulmonary Tuberculosis ..	682
Arterio-Sclerosis	325	Chorea Treated by Psycho-Therapeutics: Milk Isolation Treatment ...	337
Ascites, Treatment of, by means of Collargol	688	Clinical Value of Carbon Dioxide Snow with Demonstration of the New Ice Mould, The	242
Atropine in Gastric Ulcer and in Internal Medicine in General	731	Classification of Constipation in Children ..	577
Automobile Industry, The	333	Club-Foot in Infancy, Treatment of ..	611
Auto-Serumtherapy in Pleural Effusion	611	College of Physicians and Surgeons of Ontario Final Examinations	459
Babinski's Sign in Diphtheria	650	Correspondence: Medical Teaching at the University of Toronto	123
Barber's Itch Ointment	131	Danger of the Trendelenburg Position A Death Following a Vaginal Douche of Lysol ..	405
Basedow's Disease and Pregnancy ...	583		310
Beck's Bismuth Vaseline Paste Injections in Chronic Tuberculosis Sinuses ..	612		
Bier's Passive Hyperaemia	678		
Bladder in Tabetics, The	401		
Blindness, Prevention of	51		
Borderland Cases of Insanity	132		
Bright's Disease, Management and Treatment of Chronic	423		
Bronchial Asthma as a Phenomenon of Anaphylaxis ..	728		
Calcium Lactate in Eclampsia	395		

	Page		Page
Death Some Days After Chloroform ..	397	How to Act in Case of Fire	616
Delirium Tremens, Treatment of	394	How and When Shall Drugs be Admin- istered	599
Dental Hygiene and its Relation to Health	287	Hyperthyroidism	651
Denver Chemical Co. vs. Colorado Chemical Co.	269	Hypothyroidism with Reports of Two Cases	357
Depression of Skull in Newborn In- fants, Treatment of	436	Hysteria, Remarks Upon the Treat- ment of	296
Detection of Blood in the Stools, The.	523	Illeocolitis and Acidosis	755
Diagnosis of Aortic Insufficiency	680	Incontinence of Urine Following Labor	437
Diarrhoea of Basedow's Disease, Patho- genesis of the	754	Infantile Paralysis and Megacolon	729
Diathetic Anaemia	336	Infectivity of Desquamation in Scar- latina	523
Dietetic Restrictions in Cardiac Affec- tions	605	Influence of Alcohol on Immunity, The	39
Differential Diagnosis of Paralegia, The	1	Influence of a Salt Free Diet in Habit- ual Death of the Foetus	581
Digipuratum	45	Inoculative Tuberculosis Following Ritual Circumcision	106
Dionin in Chronic Atrophic Rhinitis and Chronic Dry Pharyngitis	396	Inspection of Eyes in School	531
Disadvantages of Conservative Caesar- ean Section	656	Intravenous Anaesthesia with Ether or Chloroform	608
Disease Carriers	271	Jonnesco Method of Anesthetization ..	129
Dominance of Etiology in Modern Medicine	623	Justifiable Abortion	620
Drugless Treatment of Pneumonia in Children, The	363	Laboratory Methods to the Exclusion of Clinical Investigation	114
Dupuytren's Contraction	606	Larynx, Four Rings of Trachea and Part of Thyroid Gland and Gullet Removed During Act of Suicide ..	528
Dysmenorrhæal Neuralgia	410	Latest From Von Pirquet, The	402
Dyspepsia, Treatment of	245	Law and Medicine	69
Eclampsia and the Weather	437	Lipoma of the Larynx	174
Eclampsia of Labor	657	Locomotor Ataxia, Treatment of	249
Ectopic Gestation Sac, Ruptured	179	Malignant Disease	631
Eczema of the Scalp	688	Management and Treatment of Chronic Bright's Disease	423
Effusion, Pericardial	524	Medical Education in Canada	461
Electro-Magnet in Ophthalmic Prac- tice	720	Medical Education in Vienna	686
Encapsulated Pleural Effusions	652	Medical Teaching at the University of Toronto—Correspondence	123
Enteric Fever, Treatment of	635	Medical Thoughts, Facts, Fads, Fan- cies and Fables	220
Epistaxis, Treatment of	325	Megacolon and Infantile Paralysis ..	729
Epithelioma of Larynx in a Man Aged Sixty-nine	527	Metabolism of Myasthenia Gravis With a Suggestion Regarding Treatment	678
Esophageal Cases	176	Meningitis and its Anticipation	739
Esophagoscopy and External Esophag- otomy, Relative Value	178	Migraine, Treatment of	728
Ether as an Antidote to Cocaine Pois- oning	409	Milk Campaign in the United States and Canada, a Resume of the	161
Evaluation in Pertussis	102	Missed Labor	46
Evidence of Respiration	618	Motor-car Miscarriage	48
Examination of School Children's Eyes	530	Multiple Papillomata of the Larynx ..	528
Excision of the Entire Tongue with its Results	527	Myasthenia Gravis	730
Extripation of the Lacrymal Sac	52	McGill University—Faculty of Medicine Pass List	456
Exophthalmic Goitre, Treatment of ..	730	Nature of Erosion of the Cervix.....	653
Extract of Corpus Luteum in Disturb- ances of Artificial and Physiologic Menopause	50	Nephro-Toxic Action of Flesh Meat ..	339
Eye in Diseases of the Ear, The	284	Neuroretinitis from Typhoid Fever...	44
Faith That Heals. The	505	New Horizons in the Pathology and Therapy of Nephritis	306
Famous English Physicians	397	New Method of Inflating the Stomach	687
Fatal Case of Pernicious Vomiting of Pregnancy	50	Non-specific Urethritis	607
Faucial Tonsils and the Teeth	180	Nose, Deformities of the	520
Fever Without Physical Signs	512	Obstetrical Department, St. Michael's Hospital, 1909, a Report of	19
Fibro-Myomatous Tumors, The Vagar- ies	205	Obstetrics, Gynaecology and Abdominal Surgery	86
Forceps Operation	654	Ochler's Symptom in Intermittent Limp	739
Functional Relation of the Tonsil to the Teeth	173	On the Causation and Early Diagnosis of Uterine Cancer	558
Furuncles Treated by Bier's Method ..	336	On the Commoner Types of Functional Cardiac Murmurs	481
Gastric Pain	521	On Red Degeneration of Uterine Fi- broids, with Report of a Case....	273
Glycyl Tryptophan Test for Carcinoma of the Stomach	647	Operation for Cerebellar Tumor	740
Graduates in Medicine of the Univer- sity of Toronto, June, 1910	455	Ophthalmology and Otiology.....	251
Grave Error, A Very	404	Ophthalmology and Otiology.....	734
Gynaecology, Obstetrics and Abdominal Surgery	86	Ophthalmology at Oxford.....	383
Haemorrhagic Appendicitis	740	Oxaluria	626
Harbor of Convalescence, The	269		
Haemoptysis, Treatment of Tuberculous	520		

	Page		Page
Palliation vs. Prudence	272	Removing a Wax Candle from the	
Pelvic Haematocoele and Haemorrhages		Bladder by means of Benzine....	324
Independent of Ectopic Pregnancy	310	Renewed Research on the Subject of	
Pericardial Effusion	524	Acute Overstraining of the Heart	27
Permanent Slow Pulse, The.....	680	Report of Obstetrical Department, St	
Pernicious Vomiting of Pregnancy,		Michael's Hospital, 1909.....	19
Fatal Case of.....	50	Reproduction of a Pain as a means of	
Pernicious Vomiting of Pregnancy....	478	Making Differential Diagnosis....	327
Pharmacology of Agar-agar.....	479	Ringworm, Treatment of.....	521
Phenolphthalein	394	Role of Radium in Surgery, in the	
Phthisis, The Sweats of.....	403	Treatment of Cancer, The.....	551
Placenta Praevia, Treatment of.....	411	Roosevelt, Mister, at the Sorbonne ..	407
Placenta Praevia, Treatment of.....	583	Ruptured Ectopic Gestation Sac	179
Plea for a Rational Puerperium, A ..	49		
Pneumonia, Serum Treatment of Lobar	621	Sanitation in Construction Camps....	368
Position and Work of the American		Scarlet Red for Epithelial Growth... 677	
Pediatric Society toward Public		Scopolamin and Morphine in Narcosis	
Questions	104	and in Childbirth	582
Possible Differential Sign between Car-		Serum Treatment of Lobar Pneumonia.	621
diac Dilatation and Pericarditis		Simplified Tuberculin Skin Test.....	685
with Effusion	683	Skin Rashes in Typhoid Fever.....	646
Post-Graduate Study in Edinburgh... 83		So-called R. N. Reflex Neurotic Sym-	
Pregnancy and Diabetes	656	ptoms and the Psychic Factor	171
President's Address, The	341	Solid Carbon Dioxide as a Cauterant ..	328
Press Comments on the Report of the		Some Notes on Functional Neuroses... 215	
Carnegie Foundation	543	Some Points in the Treatment of En-	
Prevention of Blindness, The.....	51	teric Fever	635
Primary Carcinoma of the Vermiform		Spasmodic Pseudo Tumors of the Large	
Appendix	679	Intestine	641
Proposed Sterilization of Certain		Spirochaeta Pallida	523
Degenerates	157	Status of Medical Men Under the New	
Proposed Sterilization of Certain		Insurance Bill—Correspondence .. 474	
Degenerates	569	Sterilization After Caesarean Section.. 180	
Prophylaxis of Acute Anterior Polio-		Still's Disease	105
myelitis	645	Stokes-Adams Syndrome, The Treat-	
Pseudoapical Murmurs	684	ment of	41
Psychological Import of the Doctrine		Surgical Hints	614
of Immunity, The	378	Surgical Suggestions	329
Puerperal Infections, Treatment of... 438		Sweats of Phthisis, The	403
Pulsus Paradoxus and Compression of		Syphilis, Report on Ehrlich-Hata	
the Subclavian	681	Preparation for the Cure of..... 723	
Pyelitis of Pregnancy, Treatment of.. 583		Syringomyelia, Treatment of, by	
		Radium	244
Queen's Medical College, Kingston... 458			
		Technique and Indications for the	
Radium in Tumor of the Eyelid..... 402		Vaginal and Caesarean Section .. 308	
Radium in the Treatment of Malignant		Test of Kidney Functioning by Elimina-	
Growths	199	tion of Disease in the Urine.... 682	
Radium Treatment of Rodent Ulcer.		Tetanus, Early Symptoms of..... 741	
Skin Cancer, Sarcoma, Keloid		That Important Rodent the Rat	330
Naevi, etc.	348	Total Atresia of the Naso-Pharynx	
Radium as a Specific in Giant Cell		Following Removal of Adenoids.. 526	
Sarcoma	93	Trachoma Bodies	421
Radium, Use of, in Treatment of Can-		Transplantation of Cartilage in the	
cer	691	Correction of Deformities of the	
Random Medical Notes in Europe..... 430		Nose	526
Rapid and Delicate Method of Detect-		Treatment of Ankylosis with Fibro-	
ing Bile Pigment in the Urine.... 676		lysin	100
Recent Findings Regarding the Dis-		Treatment of Ascites by Means of	
turbirg Elements in Milk of In-		Collargol	688
fants	107	Treatment of Depression of Skull in	
Rectal and Vaginal Use of Fibrolysin	193	Newborn Infants	436
Recurring Jaundice in Four Successive		Treatment of Disease—The Few Great	
Pregnancies with Fatal Jaundice		Drugs	134
in Three Successive Infants..... 436		Treatment of Epistaxis	325
Refraction Cases in Cleveland..... 52		Treatment of Locomotor Ataxia..... 249	
Reforming Police Court Inebriates—		Treatment of Placenta Praevia..... 411	
Correspondence	197	Treatment of Puerperal Infections... 438	
Regarding Sera	224	Treatment of Pyelitis of Pregnancy... 583	
Relation of Alcohol to Immunity... 340		Treatment of Ringworm	521
Relation to the Eye of Diseases in the		Treatment of the Stokes-Adams Syn-	
Nose, Throat and Ear—Intra-		drome	41
Ocular Disease	153	Treatment of Tuberculous Haemoptysis 520	
Relation to External Eye and Orbital		Trials of a Country Doctor, The..... 406	
Disease of Diseases in the Nose.		Tuberculin Treatment of Dispensary	
Throat and Ear, The.....	625	Patients	332
Relative Value of Esophagoscopy and		Tumor of the Eyelid, Radium in..... 402	
External Esophagotomy	178	Typhoid Agglutination in Tuberculosis 44	
Remarks upon the Treatment of		Typhoid Carrier Cases, Treatment of. 609	
Hysteria, with Special Reference		Typhoid Fever in Children, Treatment	
to the Rest Cure.....	296	of	577
Removal of Tumors of the Pituitary			
Body by an Intra-Nasal Route... 527			

	Page		Page
Use of Radium in the Treatment of Cancer and Other Diseases.....	691	Veratrum Viride in Puerperal Eclampsia	436
Use of Oil in Abdominal Surgery	479	Veronal and Vomiting of Pregnancy..	309
Use of Skin Varnishes, The.....	100	Vicious Circles in Medicine.....	9
Vagaries of Fibro-Myomatous Tumors, The	205	Vomiting of Pregnancy Treated by Adrenalin	332
Vagaries of Fibro-Myomatous Tumors, The	495	Von Pirquet's Reaction in Lupus....	339
Vaginal Douches of Lactic Acid	581	Warning Against Selecting the Medical Profession	619
Value of Nitroglycerine as a Preventa- tive of Haemoptysis in Pulmonary Tuberculosis	137	Wassermann Reaction—Its Clinical Value	235
Varicocele	98	Wassermann Reaction	620

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Original Communications.

THE DIFFERENTIAL DIAGNOSIS OF PARAPLEGIA.*

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Gentlemen,—The importance of making a correct diagnosis in a case of paraplegia lies in the fact that it is a syndrome which may occur in a very great number of nervous affections, so that a clue to the cause of it is usually at the same time a clue to the recognition of the actual disease. I need hardly remind you that paraplegia is to be regarded as a group of symptoms, and never as a disease, though it may sometimes be the most prominent manifestation of the affection present. It may be defined as a weakness, more or less complete, of the lower extremities, not due to a peripheral affection or to a lesion of the lower neuronic system. We have thus at the outset to distinguish between true paraplegia and weakness of paraplegic distribution, just as in other cases we have to distinguish between true hemiplegia and weakness of hemiplegic distribution.

The distinction between true and pseudo-paraplegia can almost always be effected by considering the symptoms of the paraplegia, quite apart from other evidences of the cause of the affection. The features to be relied on for this purpose may be divided into three. First, the nature of the paralysis; secondly, the presence or absence of nutritive disturbances, and thirdly, the state of the reflexes. As in the first case I shall bring before you it is only possible to demonstrate the third of these, I shall only briefly mention the first two. The paralysis of true paraplegia differs from that of pseudo-paraplegia in being massive, and not limited to a small group of muscles; in being always more pronounced at the distal part of the limb, and in being

* An address delivered at the Toronto Orthopedic Hospital, Nov. 13, 1909.

distributed according to certain groups of functions rather than according to the anatomical innervation of muscles. Under the second heading, that relating to nutritive disturbances, are included wasting, various trophic changes, and changes in electrical excitability. Although in true paraplegia we may sometimes meet with a considerable wasting of muscles, more than can be attributed to mere disuse, still we never see the extensive atrophy, not only of the muscles but of all the structures of the limb, that so frequently occurs in the pseudo-paraplegias, particularly in those, like acute poliomyelitis, that are due to an affection of the anterior horn cells. Profound trophic changes are rare in true paraplegia, except in the variety caused by an extensive transverse lesion of the cord, and, finally, certain of the electrical changes, particularly that known as the reaction of degeneration, are highly characteristic of the pseudo-paraplegias caused by an affection of the lower motor neurone.

The first patient* we have to examine is a boy aged six. He was sent to the hospital from Manitoba last January. The paraplegia was then practically complete, but under re-educative treatment it has greatly improved. The early history of the case is very imperfect, but all the indications present point to the affection having been an infective myelitis in the lower dorsal region. He shows very well certain changes in the reflexes, which at once permit us to say that the lesion is one implicating the upper neuronie system of fibres. You will observe that the knee jerks are greatly exaggerated, and, further, that there is present a marked contralateral adductor reflex, i.e., a tap applied to either the patella or the adductor tubercle evokes a contraction of the adductor muscles of the opposite limb. These physical signs are never caused by an affection confined to the lower motor neurone. Their significance is amply confirmed by making the following further tests. Ankle clonus is easily to be obtained, and, as you see, this shows the characteristics of the true ankle clonus, namely, it is slow in rate, regular in both time and amplitude, persistent, not to be varied by changing the pressure or the position, and consists of an almost equal to-and-fro movement instead of a recurrent downward push.

Babinski's plantar sign is also well marked, and in this connection it is perhaps desirable to interpolate a few remarks on the question of technique in testing the plantar reflex, for the value of observations on this reflex, and therefore of con-

* For permission to demonstrate the case here mentioned, I am indebted to the courtesy of Dr. B. E. McKenzie, to whom I wish cordially to express my thanks.

clusions drawn from examination of it, are often quite vitiated by non-attention to this matter. In the first place, it is absolutely essential that the limb be quite relaxed when the reflex is being examined. For this purpose the recumbent posture is best suited, and the limb should be slightly everted, a pillow being, if necessary, placed under the outer side of the knee. It is never permissible to test the reflex when the patient is in a sitting posture and holding out the limb, though this is an only too common mode of procedure. It is however sometimes possible to test it in this posture if due care be taken adequately to support the foot and the upper part of the leg. In the second place, the sole should not be tickled, for this only evokes confusing semi-voluntary movements. The stimulus should be a firm, steady one, and, with an easily excited patient, it is best to press the thumb against the sole for a short time until he is accustomed to the contact and until the foot is completely at rest. Attention should now be concentrated on the big toe, and indeed on only the tarso-phalangeal joint of this toe; flexion or extension at this joint is the crucial thing. The abnormal response, known as Babinski's sign, differs from the normal one not only in being a movement of extension as well as of flexion, but also in being much slower and in being maintained for a much longer time. This is well seen in the present case. Movement of the big toe is, however, far from being the only characteristic of the sign; of the other points, three may be mentioned. Whether the other toes flex or extend is a matter of little interest, but an occurrence of much significance, seen more frequently in children, as here, is the spreading out of the toes that sometimes accompanies, or occasionally replaces, the extensor response of the big toe; this is known as the "fan" sign. Again, eversion of the foot at the mid-tarsal joint frequently replaces the normal inversion that occurs when the sole is stimulated. Lastly, with Babinski's sign, the tensor vaginae femoris responds later than the leg muscles, instead of, as in the normal, earlier than these.

Of the numerous new reflexes that have been discovered in the past few years, I should like to call your attention to two, for they are easily to be observed in the present case. The first is the "paradoxical reflex," first described by Schäfer some ten years ago. It is so called because pressure over a flexor muscle, the lower part of the gastrocnemius, elicits extension of the big toe, or even of all the toes; in the normal this elicits flexion of the toes. The sign has exactly the same significance as Babinski's sign, and indeed it has recently been shewn¹ that

the reflex is really a cutaneous one, for the same response can be obtained by pinching the skin over the gastrocnemius. The fact is that when Babinski's sign is well marked it can be obtained from stimulation over a far wider reflexogenous zone than the sole of the foot, for instance, from the front of the leg (Oppenheim's sign), or from the upper part of the thigh (Remak's sign).

Another useful test is that described independently by Mendel and Bechterew. It consists in striking the dorsum of the foot at about the junction of its middle and posterior thirds. In the normal, extension of the middle toes follows, whereas, when a lesion of the upper neurone segment is present, flexion of these follows. The significance of Schäfer's and Mendel's signs is exactly the same as that of Babinski's, namely, they demonstrate the existence of a lesion of the upper neurone system. It is usually said that they do not occur in functional disease, but I should not like to be dogmatic on this point. Both these signs usually occur only when Babinski's is also present, but occasionally they may occur in the absence of this, and then their value in diagnosis may be very great.

The first case has illustrated some of the points by means of which we are enabled to distinguish between true and pseudo-paraplegia. The second case we shall make use of to study the problem of the differential diagnosis between the different varieties of the former condition. In doing this it is expedient to bear in mind some method of grouping the various causes of true paraplegia, so that by systematically taking into consideration one group after another, one is sure not to overlook any of them. For this purpose, I would commend to your notice the following simple scheme, which we shall apply to the next case by working from below upwards. This is not as a rule the better order, but I am adhering to it in this instance for a special reason.

A.—TRUE PARAPLEGIA.

I. *Physical*.—Hysteria.

II. *Organic*.

A. *Disease of Brain*.

I. Bilateral lesion.

(a) Cortex, general paralysis of the insane, meningitis, porencephaly, hemorrhage, thrombosis of the superior longitudinal sinus.

(b) Pons, tumour, vascular lesion.

2. Multiple lesions, tumour, vascular lesion.

3. Large single lesion, causing pressure on opposite side.

B. *Disease of Spinal Cord.*

1. Diffuse system degeneration, amyotrophic lateral sclerosis, disseminate sclerosis, combined sclerosis, Friedreich's ataxia.
2. Local Affections.
 - (a) Intrinsic—Myelitis, thrombosis, tumour.
 - (b) Extrinsic—Pott's disease, tumour, trauma.

B.—PSEUDO-PARAPLEGIA.

I. *Disease of Anterior Horn Cells.*

- (a) Acute—Infantile paralysis.
- (b) Chronic—Progressive muscular atrophy.

II. *Disease of Peripheral Nerves.*—Multiple neuritis.III. *Disease of Muscles.*—Dystrophies.

The patient is a woman of twenty-two, in whom the symptoms date back three years. Two points in the onset are especially noteworthy, namely, that it was a gradual one, and that a feeling of numbness long preceded the loss of power. When I first saw her, five weeks ago, her lower limbs were in a state of complete contracture; the flexion was so great that the knees touched the abdomen and the heels were pressed against the buttocks. Neither her efforts nor ours could unbend them an inch. Sores were present on the feet, no doubt from friction and pressure. The muscles of the thighs and legs were, and as you see still are greatly wasted. We have never been able to elicit any of the deep or superficial reflexes in the lower limbs. There has been considerable retention of urine, frequently making necessary the use of the catheter, but never any incontinence. Sensation was quite abolished up to the pelvis, and blunted above that up to the costal margin. Above the waist there are no abnormal physical signs.

The clinical picture, the outlines of which I have just sketched, is evidently a grave one, and yet Dr. McKenzie has been able, by applying continuous forced extension, to get the limbs into practically their normal position. Coincidentally with this, the patient has recovered considerable power over them, and you see that she can now voluntarily bend or straighten them, though in an uncertain and tremulous manner. With the help of special apparatus she can even walk a few steps. This striking improvement is but another perplexing element in an obscure case, and we must take up the question of diagnosis with great care, though in the time allowed me I can only indicate the main steps in the argument.

In spite of the facts that there is much wasting of muscles, and that the reflexes are all absent, it is quite easy to eliminate all the causes of pseudo-paraplegia, of which these facts would at first make us think. Let us briefly mention the causes in order. The dystrophies are evidently put out of question here, by the patient's age and sex, by the absence of any similar cases in the family, by the distribution of the muscular wasting, and above all by the pronounced sensory disturbances. Affections of the peripheral nerves never cause such widespread contractures or such profound sensory loss; there is further no tenderness over any nerve, nor has there been any pain. Acute affections of the anterior horn are not to be thought of, for the onset here was gradual. Chronic affections of the anterior horn are equally easy to exclude, for not only is progressive muscular atrophy rare in a girl of this age, but its onset is localised, and it is not accompanied by marked sensory loss.

It is unlikely that the condition is one of extrinsic paraplegia, i.e., due to pressure on the spinal cord, for the three cardinal signs of this affection, namely, root pain, unilateral onset, and precedence of motor over sensory symptoms, are all absent. An intrinsic paraplegia, due to a local lesion in the cord, is more difficult to exclude, and a diagnosis of it might readily, but erroneously, be made in this case. The following considerations, however, speak strongly against it. To produce such profound sensory changes, the lesion would have to be very severe, indeed practically complete, and it is difficult to conceive of such a lesion existing without ever causing incontinence of urine or fæces. Again, as the sensory loss extends up to the level of the sixth dorsal nerve, it is incongruous that there is no trace of weakness of the abdominal or back muscles, for extensive local lesions implicate the motor fibres to a greater extent than the sensory ones. It is hard also to picture the nature of any local lesion that could cause the symptoms present. Thrombosis and myelitis have either an acute or rapid onset, and not a very gradual one, as was here the case, while against the idea of a tumour speaks not only the absence of any tumour elsewhere in the body, in spite of the long duration, but also the marked improvement that has recently taken place.

Most of the diffuse degenerations of the spinal cord can be excluded here by the absence of other signs that accompany these conditions. For instance, with Friedreich's ataxia, there would be an early onset—before puberty—a hereditary history, the presence of nystagmus, optic atrophy, or choreiform tremor. Amyotrophic lateral sclerosis would have caused an increased

activity of the deep reflexes; against this diagnosis are further the points mentioned above in connection with progressive muscular atrophy. Disseminate sclerosis occurs particularly at this patient's age, and it is not rare for it to begin as a paraplegia. However after three years one would expect to find other evidences of the disease, such as an intention tremor, nystagmus, ocular palsy, optic atrophy or the characteristic staccato speech. One of these system degenerations of the cord, namely the subacute combined sclerosis, is more difficult to exclude, and in my opinion it is the only organic affection that seriously enters into consideration. The accompanying degeneration of the posterior columns would account for the absence of reflexes in the lower extremity, as well as for the sensory symptoms. Such extreme contractures as are present in this case are, however, rare in this disease, and the severity of the motor and sensory disturbances strangely contrast with the integrity of the sphincter action. This form of combined sclerosis is usually accompanied by severe anemia, which is not present with this patient, and the symptoms never improve so rapidly as they have here; indeed the prognosis is as a rule grave. Further, two characteristic features of this affection, pain and ataxy, are quite absent here.

Of the brain disease little need be said. A glance at the list of brain conditions that may cause paraplegia shews how easily they can be excluded. Porencephaly, meningitis, general paralysis of the insane, tumour of the brain, are all easily negatived by both the history and physical signs. The only vascular lesion that is at all likely to cause paraplegia without also affecting the upper limbs is thrombosis of the superior longitudinal sinus, an affection that is a not very rare complication of chlorosis. The slow onset and the presence of profound sensory disturbance are, however, two features that definitely exclude this diagnosis.

We have thus apparently eliminated with this patient every group of nervous affections that may cause paraplegia, and yet here remains the paraplegia. We have therefore to recall the fact that paraplegia may occur independently of any organic affection of the nervous system, and may be due to a psychical disorder. This is the diagnosis at which we have arrived in this case, namely, that the paraplegia is of a hysteric nature. This diagnosis was made not only on negative grounds, i.e., not only because the condition is inconsistent with any organic affection. There are also positive evidences indicating its hysteric nature. In the first place it is certain that the patient is a hysteric. In giving you the history of this case I omitted to mention that

she had suffered for years from what are certainly hysterical seizures. These consisted of irregular convulsive attacks, which frequently lasted for a couple of hours, and which were followed not by a deep sleep, as in epilepsy, but merely by an amnesia for the period. In the next place, all the symptoms I have described to you are not only consistent with, but are typical of, hysteria. I need only recall to you the advanced contractures and the retention of urine, both of which have been overcome by persuasive measures. Finally, some features of the paraplegia are quite distinctive of hysteria. I refer particularly to the sensory symptoms. The complete anaesthesia for all stimuli, and the amnesia for parts of the body, are very suggestive indeed of hysteria. Further, during the improvement that has lately taken place it has been possible to evoke sensations by active stimulation of the lower extremities, by strong tapplings, and in connection with this two features are especially significant. First, the strongest stimuli we can apply, namely, painful ones, are quite incapable of evoking any sensation, and we know that these are the very ones most frequently and most completely lost in hysteria. Secondly, every sensation that is evoked by tapping a point on a lower limb is accompanied by a simultaneous sensation, which the patient refers to the corresponding point on her upper limb. Thus, tapping the knee causes two sensations to be felt, one on the knee, the other in the olecranon of the same side. This is a rare symptom, the significance of which, interesting as it is, it would be out of place to discuss here, but I would point out to you that it is pathognomonic of hysteria.

You are thus once more reminded of how grave are even the physical conditions that may be produced by a physical malady, and I would further remark that the outlook in such a case as the present is similarly grave. Although the present symptoms may altogether disappear, yet they are only too likely to recur at some future date, or to be replaced by fresh, and perhaps even more distressing ones. Hysteria is an affection that is rarely cured unless Freud's psycho-analytic method of treatment² is resorted to.

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1. See Lasarew. *Neurol. Centralbl.* 1906. Nr. 7, and Ernest Jones, *Proc. Roy. Soc. Med., Neurol. Sect.* Vol. I., P. 59.
2. See "Psycho-analysis in Psychotherapy." *Montreal Med. Journ.*, Aug., 1909.

VICIOUS CIRCLES IN MEDICINE.*

BY J. T. FOTHERINGHAM, M.D., TORONTO.

Sir Clifford Allbutt has somewhere in his usual exquisite literary style referred to the part which the modern physician plays in the relief of disease, as that of the ancillary mouse in Aesop's Fable, indicating his belief that while Nature plays by far the greater part in the relief of sickness, the well-trained physician, the *iatros polypeiros* of Hippocrates, is called upon many times to nibble one string of the net that enmeshes the sick lion, and so set him free to complete his own work of healing. This is another way of saying that ill-health consists usually of a vicious circle, or of many such, which must be wisely broken in upon at the selected point, so that Nature, some of whose compensatory processes are at fault, may be set straight.

We may, perhaps, before defining Health define the term Vicious Circle. The logician by this term means *argumentum in circulo*, in which certain conclusions are drawn from certain premises and used again to prove the correctness of those premises, so that as in a circle there is no starting point. The term was many years ago transferred to medical nomenclature, and means a condition in which, while the cause produces the effect, the effect continues and reproduces the cause, so that both the proverbs are correct, "*Ablato effectu cessat causa,*" and "*Ablata causa, cessat effectus.*"

Before going into a prolonged discussion of these vicious circles it may be well to definitely state our views as to what Health means. In the first place, it is a purely relative term, because what is to one individual sound health might be, if suddenly transferred to the experience of another, a state of miserable ill-health. The chlorotic girl with 50% hemoglobin may, like a bird in his cage unaccustomed to liberty, feel quite well and cease taking her iron; the same blood state suddenly occurring in a healthy male would undoubtedly induce an acute sensation of ill-health.

Health is perhaps best defined as the normal balance of all the interacting body processes, for the maintenance of which a whole host of circles must exist. This means that, in addition to the absence of vicious circles, health depends upon a proper balance of physiological or normal circles, the interaction of

* Read at the Calgary meeting of the Alberta Medical Association, August, 1909.

various organs, as the right heart with the lungs and with the left heart; the heart with the liver and its associated digestive surfaces, the gastric and intestinal mucosae. Any one of these normal circles may become a vicious circle. From being physiological it may become pathological.

The study of a few of these many circles may help us to appreciate better the high art and skill of the true physician, especially in his capacity as a therapist, in which his first duty is to imitate Nature, to interfere with her processes only when forced to do so, and, as far as may be, always with the object of assisting Nature along her own lines where her own efforts seem not to be tending to the desired end. Therapeutics in this sense may perhaps be called a science rather than an art, though both these aspects are essential, just as anatomy is essential to both the surgeon and the physician from the point of view of science, and is equally essential, though in a totally different way, to the artist, if his painting or his statuary are to be true to Nature.

To illustrate, a few of the physiological circles which suggest themselves are as follows: The size of the pupil of the eye determines and is determined by the amount of light entering it; the growth of the brain, other things being equal, depends upon the intellectual activity of its possessor, which in turn is increased by the growth of the brain. While this might be hard to establish as applied to any single individual, it is abundantly proved by a comparison of the Caucasian and Negroid skulls, and of the inventive and intellectual performances of these two branches of the human family. One may refer, too, in the same connection, to the very interesting effect upon the female pelvis due to the requirements of child-bearing—the negro female pelvis standing half way between the round capacious pelvis of the Caucasian female and the narrow pelvis of the monkey.

Again, the normal balance of the blood as regards quality and quantity depends upon a regulating mechanism in health controlling haemogenesis and haemolysis, the original impulse being probably chemotactic in character. One need only refer to this to remind you of the disastrous results seen in pernicious anaemia when this normal circle is perverted into a vicious one.

A fourth example of a normal circle has recently been advanced by the physiologists, some of whom say that exophthalmic goitre and its symptoms are due to a disturbance of the balance between the thyroid and adrenal secretions.

Again, the action of the respiratory centre and the state of the blood are mutually dependent, the activity of the centre

being augmented if the carbon dioxide tension in the blood increases, and depressed as that tension falls. The rate of the heart and the blood pressure also are each determined by the other. With high tension the rate is slowed, while a fall of pressure increases the rate, the adjustment being made through the central nervous system. This is most interestingly seen in the high tension and slowed pulse which accompany increased intracranial pressure as in depressed fracture or subdural hemorrhage. Nature is seeking by the increase of pressure to maintain the nutrition of the compressed portion of the brain tissue, which, as is well known, like all other nervous tissue, is extremely sensitive to deprivation of its nutriment, the high tension being thus Nature's attempt to ward off the impending disaster.

Still another example showing how gradually a normal circle may be perverted and shade off into a vicious one is the arrest of intestinal movement and the abdominal rigidity by which Nature seeks to check the spread of peritoneal infection. The intestinal stagnation and putrefaction thus induced adds to the toxemia which is putting the life into jeopardy.

We may now perhaps, having at least partially cleared the ground and opened up the way, proceed to discuss vicious circles, and in this discussion I wish at the outset to disclaim any great originality, and to acknowledge my obligations to a series of papers on this subject published within the last few years in the *British Medical Journal* and the *Lancet* by Dr. J. B. Hurry, of Reading, England. He defines the term, vicious circle, as "A morbid condition in which cause and effect are so correlated that cause becomes effect and effect becomes cause."

We must exclude from our definition spurious circles in which there is no reciprocal action between cause and effect, such as congenital malformation of the heart, in which the arterial and venous systems communicate direct, or the short circuiting occasionally seen after a gastroenterostomy when the contents of the stomach on passing through the artificial opening instead of going on down the intestine, are carried back through the short loop into the stomach again.

As I have already said, the vicious circle is often one of Nature's good circles gone wrong, or a failure of one of Nature's attempts at compensation. The recognition of these vicious circles is frequently difficult. Practice in the detection of them is certainly a profitable exercise, training one's habits of observation and increasing one's clinical acumen.

Dr. James Mackenzie, formerly of Burnley, now of London,

one of the acutest of observers, the author of that well-known work on the "Diseases of the Heart," in a new volume which he sent me only this month, called "Symptoms and Their Interpretation," refers thus to the question:

"Medicine has not attained that place in science which ought of right to belong to her. Instead of leading the scientific development and giving guides and indications to the allied branches, she is too often content to languidly follow in their wake or to pursue some erratic course of her own. The observations made in her name are frequently made more to support some vague speculation or far-fetched theory than to realize the actual condition of the observed phenomena. The sister sciences, in place of seeking for assistance from medicine, look askance at the wild speculations put forth in the name of medical science and at the loose thinking and play of the imagination which many medical writers deem legitimate in dealing with the phenomena of disease. To emancipate medicine from this position of inferiority and to secure for it that status which it ought to possess, an effort must be made as far as possible to free it from the habiliments that have hampered it in the past, and if this appears an unattainable goal at present its writers may at least aim at greater precision in thought and in observation. Although this doctrine may seem the commonest platitude, and teachers and writers of text-books are unwearied in inculcating it, nevertheless precision in thinking and in observation are among the rarest qualities. The power of acute observation and precise thinking is so seldom acquired, because methods have become stereotyped, that many observers do not realize that they are fettered in the bonds of tradition. Even in the writings of those who claim to be exponents of exact observation and logical reasoning, loose thinking too often appears, even when the scientist imagines himself supreme. What are called observations are but a mixture of imperfect observation and unwarranted deduction."

We must, I think, admit that these somewhat scarifying observations are only in the main too true, and if I can by this exercise train myself and help any of my hearers to more accurate study and clinical observation I shall feel myself amply rewarded.

Dr. Hurry in the papers referred to classified his vicious circles by their etiology into Organic, Symptomatic, Infective, Chemical, Mechanical, Neurotic and Artificial. He also classified them by the names of organs involved (only partially, as he would himself admit), into those of the Circulation, including

the Blood, the Vessels and the Heart, the latter being again subdivided into those due to the myocardium, the endocardium, the pericardium, neuroses and those due to falling blood pressure.

His second great group in this class is vicious circles in the Digestive System, subdivided again into those of the mouth, the stomach, the intestines, and the rectum and anus. A third group is vicious circles of the Respiratory System.

Without pretending to exhaustively discuss this somewhat imposing list of vicious circles, an example or two of each kind may be profitably considered.

Organic circles are those arising between two organs so interdependent that difficulty with the first may cause difficulty with the second, which in turn upsets the first, and *vice versa*. An example familiar to everyone is the dilatation of the right heart due to obstruction to the circuit in the lungs by pneumonia, the dilatation being caused by the pneumonia, and in turn aggravating the pneumonia by permitting stagnation of blood in the lungs.

Mitchell Bruce vividly describes another vicious organic circle, as follows: "When the wall of the heart fails the liver affords it temporary relief by accommodating mechanically within it the blood that otherwise would be overburdening the cardiac chambers. The hepatic functions, and in their turn the stomach and bowels, which are dependent on the portal circulation, presently become deranged, and thereupon the heart is further weakened, and it may be, finally undone, by a set of conditions made for itself and for its own immediate temporary advantage. The heart has paid dear for the accommodation; the day of reckoning has come. Bad has led to worse. A vicious circle is established—the penalty attending the accommodating process and the vicarious action by which one organ assists another in distress."

One need scarcely point out how this vicious circle may spread and involve other circles, systemic as well as portal, including organs so remote as the kidneys and the brain, a good example of what I meant a few moments ago when describing health as the proper balance and interaction of all the various circles and processes in the body.

The next group of vicious circles, the symptomatic, includes a great number perhaps readily enough suggesting themselves to you as I speak; for instance, urticaria, by its severe itching, produces scratching, with a resulting increase of the urticaria; or intussusception is due to increased peristalsis, and itself causes increased peristalsis. Strangulated hernia causes vomiting, and

is increased by vomiting. Brain tumor may cause vomiting, which, by the straining, may cause hemorrhage into the tumor, increasing its size and hastening the final catastrophe. Obesity usually predisposes to indolent habits; result, increased obesity.

The third group, that of infective circles, is a most familiar one. The pin worm is reproduced and the circle maintained by the transference of its ova by the nails of the child host from the irritated perineum to the mouth; or in tuberculosis, fresh inoculations, as in the larynx or the opposite apex, are due to the sputa coughed up from the primary lesion.

A good example of a mechanical vicious circle is that seen in the ordinary abductor paralysis of the larynx in the horse, known as "heaves," in which over-exertion, by causing deep breathing, causes the sucking together in inspiration of the vocal cords; or in the occasional dyspnoea of some cases of simple goitre, in which the dyspnoea, started perhaps by some casual effort, causes the extraordinary muscles of respiration, especially the sterno-hyoid and the sterno-thyroid to overact and compress the goitre, thus increasing the difficulty and completing the circle, with sometimes fatal results. Or again, in paraphimosis, the preputial band, unless relieved, steadily increases the strangulation and oedema of the glans, each reacting viciously on the other.

A good example of the chemical vicious circle is seen when, in diabetes, the thirst causes abundant drinking. This causes dilution of the blood, and this polyuria, with consequent concentration of the blood and returning thirst and drinking. The knowledge of most of us of the chemical correlations of the healthy body is but slight, but enough is known of physiological chemistry to enable one to express the opinion that the next twenty years will show a great increase of our knowledge of this group of vicious circles.

As to neurotic circles, many, if not most of them, may be said to be functional, as in the case of neurasthenia, in which prolonged repose not only calls for further rest, but is damaging to and impairs ordinary ambition, so as to abolish all inclination for physical and mental exertion. The vicious circle may, and usually does, if the patient be a female, involve the mother, sister or other female relative. Oliver Wendell Holmes has said: "An hysterical girl is a vampire, who sucks the blood of healthy people about her." Weir Mitchell says, in his little treatise, "Fat and Blood," "Nothing is more sad and pitiful than these partnerships between the sick and selfish and the sound and overloving. By slow but sure degrees the healthy life is absorbed by the sick life in a manner more or less in-

jurious to both, until, sometimes too late for remedy, the growth of the evil is seen by others."

The neurotic vicious circles associated sometimes with the digestive, sometimes with the cardiac, and often with the sexual apparatus, show themselves very frequently in a correlation of local morbid conditions, a tender ovary, a loose kidney, a chronic irritation of the colon, and so on, with the constitutional condition of irritable weakness, in which the subconscious sensory stimuli from the sources indicated, which, in ordinary health would never reach the sensorium, are elevated to the realms of consciousness, and become harassing realities to the sufferer. The pain is felt severely because the nervous system is sensitive, and has itself the effect of weakening the nervous system still further. Indeed, often in the normal human being the loss of self-control and of mastery over one's emotions, which is due to the physical weakness of a fit of acute illness, adds greatly to our sensitiveness of pain and distress.

A few words about the last in the group classified by their etiology—artificial vicious circles. These will, I think, be best illustrated by examples of over-dosage or the injudicious use of drugs, such as alcohol, tobacco, opium or similar narcotics, or the use of belts or other supports, to the exclusion of Nature's muscular mechanisms, and so on. The drug habit is but too familiar to us all. The old proverb applies, "*Vires acquirit eundo.*"

Alcoholism induces chronic gastritis, morning vomiting, loss of appetite, exhaustion, depression, physical, mental and moral, and the sufferer, on rising from a perhaps unrestful bed, promptly goes back, as the old proverb has it, "for a hair of the dog that bit him."

Tea, especially infused long and consumed in large quantities, causes dyspepsia and constipation by its tannin, habituates the nervous system to stimulation by its active principle, and induces an irritable weakness and a desire and need for more, which we see perhaps even more strikingly in the devotee of morphine.

The physician who knows digitalis vaguely, merely as a "cardiac tonic" and diuretic," if he finds a patient to whom he has been giving the drug suffering from small, feeble, rapid pulse, circulatory failure and suppression of urine, would probably seek by increasing the dose of digitalis to relieve the symptoms which are probably due to his already injudicious use of the drug.

Hyoscine, valuable as it is in some acute manias, is sometimes so used as to cause the persistence of the mania, for instance, that of alcoholics.

Sodium salicylate, useful as it is in acute rheumatic fever, is not infrequently responsible for delirium, which is no part of an uncomplicated attack of rheumatic fever, but usually means a complication, such as hyperpyrexia, pericarditis, or meningitis, or too much salicylate. Reduce the sodium salicylate, delirium may and often will disappear.

Of our second mode of grouping, by names of organs involved, a few examples may be briefly mentioned. Of circulatory vicious circles, a very simple example is that of the association of chlorosis with gastric ulcer. The malnutrition of the chlorosis makes the gastric mucosa vulnerable; it bleeds, and so the anemia is suddenly increased. Everyone knows the unwisdom of seeking to immediately correct such an anemia by the use of iron, although the patient is most urgently in need of it, the irritation of the stomach by the iron being probably the procedure most likely to induce further vomiting and bleeding. The less dangerous simple dyspepsia of anemia is an exactly similar vicious circle, the result of the poor quality of the gastric juice elaborated by the peptic glands from the depraved blood with which they are supplied.

Myocardial change, whether induced by coronary disease or not, must mean reduced propulsive power, therefore, less well-filled coronaries, therefore progressive myocardial change.

Dr. Samuel West, of St. Bartholomew's Hospital, long ago pointed out that between the two sides of the heart a vicious circle may be established, because when the right side of the heart fails, perhaps from some pulmonary condition as bronchiectasis or emphysema, the engorgement of the right side overloads the coronary veins which open into the right auricle, from which, of course, arise impaired circulation and mal-nutrition of the whole heart muscle. Even more frequently seen are vicious circles associated with valvular lesions. So long as compensation is maintained, the tendency to the formation of these vicious circles is pretty well controlled, but with the rupture of compensation, as for instance in cases of aortic regurgitation, the period of repletion of the coronary arteries is reduced in length, so that impaired nutrition of the cardiac muscle follows, lessened working capacity, increased regurgitation, still less complete filling of the coronaries, and finally the catastrophe, sometimes with startling suddenness.

Still another quite evident vicious circle is seen, especially in malignant endocarditis, in which the bacterial growths and

erosions of the valves send off showers of infective emboli, spreading disaster, sometimes in the brain, sometimes in the spleen, the eye, the kidney, and other far-separated organs.

But for fear of wearying you I shall forbear, and briefly display in graphic form before I sit down a few of the more striking vicious circles to which I have been referring.

To conclude, what lessons may we draw for our own profit and that of our patients from this brief and insufficient discussion of the subject? I hope that I have succeeded in convincing you, as I have myself, of the very great importance of the subject. This importance, I may say, is two-sided. It bears directly on our evolution as physicians, and it bears very strongly upon the health and fortunes of our patients. The physician, if he be not yet the many-sided one of Hippocrates, may, and certainly will, improve his many-sidedness in proportion as he follows up the line I have suggested.

In what does clinical experience consist? I have been for many years accustomed to teach my classes that it does not consist only in the number of cases, say of pneumonia, which one sees, but in the care and industry with which one observes, so that, as I have many times said to them: "If I had pneumonia there are house physicians of my acquaintance who have seen and carefully studied perhaps ten cases of pneumonia, to whom I would rather entrust my fate than to some practising physicians of my acquaintance who may have seen a hundred," for the reason that the younger man has a more definite "composite photograph" of the disease, its natural history, and its usual course, as part of his mental and professional equipment, as the result of trouble taken in observation, than the other non-observant careless man has been able, or rather willing, to acquire from his hundred cases. Clinical experience, like genius, is in the main an infinite capacity for taking trouble.

Now, as to our patients, in prophylaxis, in diagnosis and in treatment, there is no doubt, I think, that by careful, painstaking and accurate observation and consideration of the natural history and course of disease, the physician may sometimes at least foresee and forestall the establishment of a vicious circle.

For instance, consider the use of digitalis for a threatening heart failure in pneumonia, not as a matter of routine, but because the right heart is showing early signs of being in difficulty. And here let me digress for a moment to warn you against routine, and against the man of one drug or of specifics. Pay no attention to the remarks of the man who says that, for instance, all pneumonia will do well only if treated

with digitalis. We have all seen papers and heard remarks of this sort. Therapeutics is in part a science, but in the main an art. Skill in treatment, and wisdom in intervention upon the processes of Nature, are mainly the result of experience, and are, therefore, an art rather than a science; and lest we should forget and become vain in our modern knowledge, let me quote you once more a very old proverb, "*Melius est praevenire quam praeveniri.*"

As to the advantage to the patient in the way, secondly, of diagnosis, it is a mere platitude to say that the detection of the diseased condition with sufficient accuracy to give it a name, is one thing, and usually comparatively easy; but that the Greek word "diagnosis" means "through and through knowledge" not of the disease but of the patient. What of the man who sees, correctly enough, that the patient has pneumonia, but fails to note that he has with it a leaking or obstructed mitral valve? How far could he be trusted in his prognosis and in his treatment? No diagnosis can be said to be completed till an exact, or at least as exact as possible, a recognition is had of all the interacting forces that tend to dissolution or to recovery.

For example, a tender ovary or a loose kidney may be the link in the bonds by which the patient is enmeshed as a neurasthenic, and so simple a thing as the wearing of a belt, or possibly, but very rarely, so great a thing as an ovariectomy, may be all that is needed to secure health.

Or, again, the headache and vomiting of an acute glaucoma. If a thorough diagnosis be not made, and the condition recognized as something else than a simple bilious attack, what shall we say of the diagnosis which ends in prompt destruction of the retina and lifelong blindness?

And thirdly, as to treatment, I need carry my argument no farther, having already given examples of what I mean under the head of artificial vicious circles, illustrated by mistakes in the use of digitalis, hyosine, and sodium salicylate. Many similar examples are doubtless suggesting themselves to you as I speak. Do not let vicious circles be established if foresight and skill can prevent them. Once again, it is better to anticipate than to be anticipated. Let us try always to follow the wise advice of Ovid, so often quoted, and still worth quoting again:

*"Principiis obsta; sero medicina paratur
Cum mala per longas convaluere moras."*

"Meet symptoms at their starting; too late the potion is prepared when vicious circles have grown strong through long delays."

REPORT OF OBSTETRICAL DEPARTMENT, ST. MICHAEL'S HOSPITAL, 1909.

BY DR. FREDERICK FENTON.

TORONTO, November 26th, 1909.

Mother Superior, St. Michael's Hospital, Toronto:

MADAM,—I have the honor to present the following report of the work done in the Department of Obstetrics during the twelve months ending September 30th of this year:

Patients (not yet confined) remaining in hospital Sept. 30th, 1908	3
Patients admitted during the year	242
<hr/>	
Total	245
Patients discharged (not confined) during the year.....	15
Patients confined during the year	215
Patients (not yet confined) remaining in hospital Sept. 30th, 1909	15
<hr/>	
Total	245

There were two twin births, making a total of 217 infants born.

Nine infants were born dead, and twenty died in the hospital.

There were three maternal deaths.

Of the patients confined, 154 were under the charge of the Obstetrical Staff, and the balance, 61, under various members of the Hospital Staff.

Of the patients confined, 154 were under the charge of the nine instances the sex was not recorded.

POSITIONS AND PRESENTATIONS.

Left occipito-anterior, 106; right occipito-anterior, 27; right occipito-posterior, 10; left occipito-posterior, 2; face, left mento-anterior, 1; hand, 1; breech, 6; foot, 1.

In those cases not attended by the members of the Obstetrical Staff (61), no record was made of position and presentation.

The following operative deliveries are recorded:

Forceps delivery, 47 times; rotation and forceps, 4 times; version, once, and Caesarean section, 3 times.

Labor was induced once for pyelitis of pregnancy, and on one occasion a hydrocephalic head was aspirated. In both instances the infants were delivered alive, and both mothers recovered.

There were three cases of placenta prævia, in which all the mothers and two of the children recovered. In the case in which the child died, the pregnancy had only advanced to the fifth month, and the hemorrhages were very severe.

Two cases of eclampsia occurred, one antepartum, of which a detailed account will be given, and the other postpartum. The former died two weeks later, and the latter recovered.

Precipitate labor was recorded in four instances, in none of which was there any serious injury to mothers or infants.

There were two cases of postpartum hemorrhage. Both recovered. (It is interesting to note that in neither of these cases was any anæsthetic used.)

In ninety-six cases there was more or less injury to the maternal soft parts, as follows: Slight perineal tears, 67; moderate, 17; severe, 2; vaginal tears without perineal, 3; perineal and vaginal, 4. In four instances tears of the cervix were repaired; one severe, in a case of placenta prævia, one moderate, in a case of version, and two moderate, which were causing subinvolution.

There were four cases of mastitis, one of which resulted in abscess formation.

There were fifteen premature labors. Five of these infants were born dead; five died within a few hours, and five left the hospital well.

Nineteen mothers had elevation of temperature during the puerperium, due to the following causes: Gonorrhœa, with salpingitis, 2; mastitis, 3; cystitis, 1; retained membrane, 1; pyelitis, 1; constipation, 3; vaginal abscess (gonorrhœal), 1; abdominal Cæsarean section, 1; sepsis (presumably avoidable), 6. Of the six presumably avoidable cases, one had fever for two days, one for three days, one for four days, two for five days, and one for seven days. All recovered, and the highest temperature recorded amongst them was 102.3 degrees. The total morbidity amounted therefore to 8.84%. Excluding cases in which gonorrhœa had been demonstrated prior to labor, cases of mastitis, cystitis and pyelitis, as well as those in which there was a transient temperature due evidently to the existence of constipation, and leaving only those cases which might properly be classed under the head of puerperal infection, the

morbidity rate drops to 3.72%. None of these patients were ever seriously ill, or suffered any permanent ill-effects as a result of the sepsis, nor was it necessary to transfer any to other wards on that account.

Of the 55 delivered by operative procedure, only two had any elevation of temperature.

Examinations of the urine showed that thirty-six patients suffered from albuminuria, seven from glycosuria, sixteen from oxaluria, and that three had casts in the urine without albumen.

Of the three Caesarean sections done, two were for contracted pelves, where former labors had resulted in dead children, and in both instances both mothers and children recovered.

The third was a vaginal section, done for eclampsia at about the thirty-fourth week of gestation. There had been five convulsions before admission to the hospital.

The baby was delivered alive, and did fairly well on artificial food for two weeks, when it died suddenly and unexpectedly in convulsions. No post-mortem examination was permitted.

The mother had no recurrence of convulsions, and regained consciousness in a few hours after the operation.

She remained well till the fourth day after, when she developed a pneumonia affecting the right lower lobe.

This attack terminated on the ninth day, thirteen after delivery, but two days later the upper lobe of the same lung became similarly involved, and she died on the sixteenth day after delivery.

The operation wound had completely healed, and involution had proceeded satisfactorily.

The causes of death of infants who died in hospital, after delivery, were as follows:

Hydrocephalus, 1; premature birth, 5; hemorrhage neonatorum, 2; birth injuries, 4; cord infection, 1; atelactasis, 1; parotid abscess, 1; artificial feeding, 4; pneumonia, 1.

The maternal deaths resulted from the following conditions:

Acute miliary tuberculosis, apparently originating from an old tubercular knee; pneumonia, following vaginal section for eclampsia; and mitral stenosis, from which condition the patient was more or less water-logged on admission some weeks before delivery.

In presenting this report, I take the opportunity of express-

ing my appreciation of the work of the Nurses and House Staff, to whom much of the credit for the very low morbidity rate must be given, and to whose faithful discharge of duty in the carrying out of instructions the satisfactory working of the department has been made possible.

To Drs. Crawford and Magwood I am deeply indebted for their hearty co-operation in the work of the department. It is to Dr. Magwood's untiring efforts in the indexing and filing of histories that this report of the year's work must be credited.

I wish to express my thanks for the ready and cheerful adoption of my suggestions regarding the administration of the department and the prompt furnishing of all instruments and appliances requisitioned for by me.

Faithfully yours,

FREDERICK FENTON.

75 Bloor Street East.

CANADIAN TRAINING SCHOOLS FOR NURSES.*

BY MISS CLARA GREENE,

Superintendent of the General Hospital, Belleville.

Trained nursing is the outcome of the reformation that has been gradually taking place in the practice of medicine. We know that there are preventive and curative agents outside of pills, powders and dosage; for, however good the treatment may be, to be of value it must be carried out fully and faithfully, and the ordinary hygiene of the sick room, the special rules for sick diet, must be observed by a person of intelligence, tact and unwearied vigilance, or a great deal of the work of the physician is lost.

As early as 1859 Florence Nightingale felt this, and handed over the fund that had been presented to her after her work in the Crimean War, to St. Thomas' Hospital, for the purpose of opening a school for the training of women in the care of the sick and the wounded. This school was called the Nightingale Institution. Unfortunately, the class and the number of women who entered it did not give promise of great success to the movement. They were women who saw before them the prospect of a respectable and comfortable living without undue expenditure of labor.

About 1868 an appeal was made to Miss Nightingale for assistance in reorganization, and a new order of things was instituted. After an almost wholesale weeding out of the old nurses, a better class of women were taken on as nurses, sisters and hospital superintendents. Two classes of probationers were given instruction—probationers and special probationers. The former class included those who received during their year of training from the Nightingale Fund payment in money and clothing to the value of about £16, or \$80. The latter paid £30, or \$150, for maintenance during the year of their training. This arrangement was made to give gentlewomen an opportunity to qualify themselves in the practice of hospital nursing. The training occupied one complete year, after which they were expected to continue their work for three years in connection with the hospital or some institution for the care of the sick.

Even this improved training did not supply the need nor give the comprehensive education required to elevate nursing to a

* Read before the Canadian Society of Superintendents of Training Schools for Nurses.

scientific art, although it was the only systematic one given in England at the time. In the *Lancet* of May 21st, 1872, we find the following:

“The importance of efficient and skilled nursing in the management of the sick is now so thoroughly understood and appreciated that we do not hesitate to acknowledge our satisfaction in meeting with the following paragraph in a notice circulated among the influential members of the profession in London and the aristocracy generally: ‘It is proposed to establish an institution in this country similar in its objects and constitution to the *Frauen Verein*, of Darmstadt, Germany. It will be intended chiefly for the education of ladies who are anxious to devote themselves to nursing as a profession.’”

This institution was called the National Nursing Association.

From these beginnings we find the spread of training schools for nurses to the other hospitals in London and England, across the Atlantic to the United States and to Canada. The year 1872 saw the opening of three training schools for nurses in the United States, namely, Bellevue, New Haven and the Massachusetts General, all three being the outcome of the conditions existing during and after the Civil War, and brought about by the earnest efforts of a few charitably disposed ladies, with the expenditure of much time, labor and money. The training received at these schools was to fit women to care for the sick poor.

In Canada, the town of St. Catharines was the first to follow the lead of Miss Nightingale. In the year 1873 plans were laid for the establishing of a training school for nurses in connection with the General and Marine Hospital, which had been founded by Dr. Theophilus Mack in 1865.

Dr. Mack was untiring in his efforts to promote the usefulness of the hospital, and to his remarkable enterprise is largely due the fact that a training school for nurses was established in St. Catharines long before the larger cities of the Dominion had taken this question up, and, indeed, at a time when nurse training schools were practically unknown on the continent, and only a few of the larger hospitals in Great Britain were known to be training nurses.

Dr. Mack and those connected with him, being anxious to introduce into Canada the system of training that was proving such a success in the old land, Miss Money, the matron of the hospital, was commissioned to go to London, England, for the purpose of bringing out two trained nurses and others willing to be taught, to the number of five or six.

In the winter of 1873 Miss Money sailed upon this mission.

She returned early in 1874, bringing with her three trained nurses from Guy's Hospital, London, and by June of the same year St. Catharines Training School for Nurses was established. It was afterwards given the name of the Mack Training School, in honor of its founder.

This, the oldest school in Canada, has been in existence continuously for thirty-five years, and is to-day one of the best known of the smaller training schools.

In the *Canada Lancet*, July 31st, 1877, we read as follows: "It is proposed to establish a training school for nurses in connection with the General Hospital, Toronto. Miss Goldie, Lady Superintendent of the Hospital, will assume the management. She has had considerable experience in the Franco-Prussian war and in British and Continental hospitals, and is, therefore, eminently qualified for such an undertaking.

It was not, however, until four years later, April, 1881, that the training school in connection with this hospital was really established. Up to this time the nurses were of the type found in all hospitals prior to the establishment of training schools. Educational advantages were not considered essential, and, indeed, most of these women were of the charwoman type, and were more anxious to keep up their own spirits by an occasional touching of their lips to the bottle than to concern themselves about the comfort and welfare of their patients. They slept in rooms off the wards, and took their meals in the basement.

In 1884 the training school was reorganized on a modern basis, under the management of Miss Snively (a Canadian, and a graduate of Bellevue Hospital, New York), the present Superintendent of the school, and from this time forth the spirit of improved nursing was abroad in our land.

The training school of the Toronto General Hospital is the largest in Canada at present, having one hundred and ten pupil nurses on the roll.

In the year 1876 two training schools were organized, one in connection with the Hospital for Sick Children, Toronto, and the other in connection with the General Hospital at Kingston.

In the years which followed the number of schools for nurses grew apace in connection with hospitals large and small. Of these we will only have time to mention a few of the more important.

The Lady Stanley Institute for Trained Nurses, Ottawa, or-

ganized in 1890, at the suggestion of Lady Stanley, wife of the Governor-General of Canada at that time, and named after her. This was an independent corporation, though the pupils received their practical training in the wards of the County of Carleton General Protestant Hospital and in the Ottawa Maternity Hospital.

In March of the year 1901 the Lady Stanley Institute was, by Act of Parliament, amalgamated with the County of Carleton General Protestant Hospital. The training school then became an integral department of the hospital, under the same management and control. The Act provides that it shall be maintained by the hospital, and continue to be known as the *Lady Stanley Institute for Trained Nurses*.

Another of the schools organized about this time was that in connection with St. Michael's Hospital, Toronto, opened in 1892 with five pupil nurses. This school has now 45 pupil nurses.

The oldest and best known school in British Columbia is that of the Royal Jubilee, in Victoria, founded in 1897 in commemoration of the Diamond Jubilee of our late Queen.

In Manitoba, the Winnipeg General has been doing good work for a number of years.

In Lower Canada, the honor of establishing the first training school (1890) belongs to the Montreal General Hospital. Many attempts made previous to this date had ended in failure. As early as 1870 a matron was selected and sent out to this hospital by Miss Nightingale, but after a few years of uphill work she returned to England. Whether the methods employed were at fault, or whether those in authority failed to grasp the situation, it is difficult to say; but the various attempts, as I have said before, were dismal failures. Like all other hospitals of that period, the Montreal General had its trials, the same faulty methods prevailing there as elsewhere. The nurses were hired by the month, and treated as servants, but neither housed nor fed as well as the servants of to-day. To-day the Montreal General is the second largest school in the Dominion, having eighty-five pupil nurses.

Montreal also boasts of another large school, the Royal Victoria Hospital, organized in 1894, the pupil nurses on the roll this year numbering seventy-six.

When we remember that thirty-five years ago there was but one training school in Canada, and that to-day we have over one hundred well-organized schools, and over fifteen hundred pupil nurses in training, we feel that we have every reason to be proud of our position in the nursing world.

Selected Articles.

RENEWED RESEARCH ON THE SUBJECT OF ACUTE OVERSTRAINING OF THE HEART.*

BY PROFESSOR SCHOTT, M.D., NAUHEIM.

My Lord Duke, Ladies, and Gentlemen,—Before proceeding to read you my paper on acute overstraining of the heart, allow me to express my sincere thanks to the distinguished faculty of the West London Post-Graduate Medical College for the great honor they have conferred upon me by their kind invitation to deliver this address this evening.

While in the first half of the last century the valvular affections of the heart, with their train of symptoms, received the almost exclusive attention of the medical world, the chronic diseases of the cardiac muscle, and above all its functional disturbances, became later on the subject of much closer investigation. The organic changes in the heart muscle were in many cases not difficult to determine, either microscopically or more especially under the microscope, but it was otherwise in the case of those disturbances which we denote as purely functional. And it was here that—as must be familiar to everybody, especially in this country—the pioneer work of Peacock, and his observations on Cornish miners, acquainted us with the true character of cardiac overstraining. From that time forward this chapter of cardiac pathology has never ceased to command the sustained and watchful interest of the medical world. Furthermore, the great development of athletic sports which has taken place during the last two decades, especially here in England, has greatly increased the number of cases of cardiac overstraining which in consequence came under medical observation. These observations of Peacock were confirmed later on by the investigations of Myers, Clifford, Allbutt, Da Costa, Johann Seitz, Münzinger, and others. Nevertheless, knowledge of the true facts concerning overstrain of the heart could only win its way very slowly, for many declared themselves to be definitely opposed to the new teaching, whilst others spoke with very great caution and made known to the world their manifold doubts on the question, as, for instance, Von Schroetter, E. Seitz, and Strümpel. It was

* Delivered at the opening of the Winter Session of the West London Post-Graduates College, on October 11th, 1909.

the investigations of Leyden and Fraentzel which once more gave a fresh impetus to the researches on this subject.

I myself have reported in the year 1890 at the Ninth Congress of Internal Medicine in Vienna a series of experiments which I made in order to determine whether bodily overstraining could produce alterations in a healthy heart, and also to determine eventually the nature of such changes. For this purpose I selected young, robust individuals, from 14 to 32 years of age, whose previous state of health, as well as the physical examination to which I subjected them, showed them to be free from any anomaly of the heart whatever. I made two of them wrestle with one another, resisting or lifting each other, until a high degree of dyspnoea had been produced by the previously increased muscular straining. In a second series of experiments, in order to increase the dyspnoea and render the cardiac action still more difficult, I fitted a leather belt close under the costal arch of the subjects and made them wrestle while thus hampered. In both series of experiments I actually did find that, when such severe physical overstrain leads to dyspnoea, the heart undergoes a greater or lesser amount of dilatation. This I designated as acute cardiac dilatation, which, of course, is to be regarded as a temporarily abnormal, but not as a pathological, condition. This, as I mentioned at the time, is evidenced by the fact that in healthy, robust persons such an artificially produced cardiac dilatation can generally recede entirely within a very short time, often in one or two minutes. I must add that in my first experiment the cardiac dilatation was determined, not only by a colleague and with ordinary percussion of the absolute cardiac dulness, but also by myself, and according to the method of my brother, August Schott, consisting in the percussion of the total heart limits with lateral limitation. The experiments I made with this method on animals, as well as the investigations conducted by me later on in the Berlin Maison de Santé on the human cadaver, have shown the possibility of determining the anatomical limits of the heart by means of this kind of percussion.

When, subsequently, the heart and its movements were made evident to the eye by means of the Roentgen rays, I found all the observations I had made by percussion fully confirmed, not only by the determination of the heart limits on the barium platino-cyanide screen, but by Roentgen photographs as well. It is especially these that show the expansion of the left ventricle, and notably with a depressed diaphragm. In order to find the true measures I rendered the nipples visible by means of small

pieces of thin sheet lead, while by fixing the body of the subject under examination with straps around the head and shoulders, also by very exact drawings of the outlines of the feet on the floor, I had taken care to place the man always accurately in the same position relative to the apparatus, before wrestling and after. I had marked the nipples exactly by making dots on gelatine strips, and using these as reference marks, I could verify their being again in the same place at the second examination. Naturally, only such experiments were regarded as conclusive in which all these precautions were rigidly adhered to. It was also the purpose of the above-described experiments to show that by a succession of bodily over-exertions the clinical picture of chronic cardiac overstraining may be developed. For, as I mentioned at the time, chronic overstraining of the heart is to be regarded as the result of a repetition of excessive muscular efforts. In order to illustrate this point, I also added to my article the description of a few cases, and I found my views to coincide with the observations of Peacock, Clifford Allbutt, Fraentzel, Leyden, and several others.

Not only my experimental researches, but also my statements concerning especially such cardiac anomalies as follow the indulgence in excessive athletic sports, soon found confirmation in the works of Mendelsohn, and more particularly in the enlargements of the heart found in bicyclists by Albu and in ski runners by Henschen. Indeed, it seemed for a while as if chronic cardiac overstraining, solely produced by the cumulative effect of repeated and abnormally strong muscular efforts, was to be incorporated as a picture *sui generis* of cardiac pathology. This, however, did not last long. The former objection was heard again, that no heart can undergo permanent dilatation or hypertrophy through severe muscular overstrain unless previously altered, either in structure or in function. In this connection doubts were also entertained whether, in my experimental investigations on acute overstraining of the heart, the subjects of the experiments had been entirely normal. These doubts were especially accentuated by the orthodiagraphic examinations of Moritz, Aug. Hoffmann, and de la Camp. Not only do these experimenters claim to have found in the course of their investigations no cardiac changes at all, or at best very insignificant ones, but they even state that they observed cases where a diminution in size of the heart had actually occurred. About the same time, as we shall see further on, others confirmed, on the strength of their own researches, the occurrence of acute cardiac dilatation following acute overstrain in previously healthy indi-

viduals. Owing to material causes it was only in the year past that I was able to undertake further experiments on the subject which interests us here, and it is upon these, as well as upon other correlated experiences gained, that I wish to report here as briefly as possible. The first question to be considered is whether it is possible for a healthy heart muscle to hypertrophy from an excess of work.

If this question be answered in the affirmative, the question would also be answered whether an excess of work will cause a heart muscle to dilate, since nowadays there is hardly a divergence of opinion regarding the theory that dilatation is the primary, hypertrophy the secondary lesion. The old view of Fraentzel to the contrary may now be considered as controverted, while that of Thurn, Jürgensen, J. Bauer, and others is, with few exceptions, generally considered to be correct. It lies in the very nature of the case—and my brother was the first to call attention to the fact—that in such conditions we have only to deal with an accumulation of blood in the cardiac cavities—in other words, with a passive, congestive dilatation, as opposed to a dilatation by compensation. And now the fine experiments of Külbs on young dogs working a long time on the endless inclined plane have revealed that cardiac hypertrophy due to work does occur, without arterio-sclerosis, without kidney affections, even without increase in size of other parts of the muscular system. Külbs communicates the results of the post-mortem examination of the hearts of such dogs as follows: "Through physical work we can succeed in bringing about, in young dogs of the same litter, of the same sex, and approximately of the same weight, a fairly considerable increase of weight of the heart, both absolute and relative. The proportion of heart to bodily weight changes in this sense, that the working dog acquires a cardiac weight approaching that of the roe-deer, whereas the dog kept for verification and comparison of results showed the proportional weights to be those of the ox."

It is thus physiologically established that simple performance of labor can lead to hypertrophy of the heart. But in men also it has been proved beyond a doubt that there is such a thing as pure, simple, cardiac hypertrophy. The exaggerated pursuit of athletic sport, which during the last 20 years has been constantly on the increase, has confirmed all the observations reported in my first publication, and one may find a large number of communications concerning cases where it was simply the physical overstraining due to excessive indulgence in athletic sports that impaired the hitherto healthy heart and led to chronic

cardiac overstrain, even in youths who had not suffered from previous maladies nor indulged in the inordinate use of alcohol, tobacco, coffee or tea. This is shown in numerous examples, which can be found in the extensive literature we already have on this subject, in very exact clinical histories as well as in the increased size of the heart found by means of the most diverse methods of percussion, also with the Roentgen rays, including the orthodiagraphic process. I need only here make a passing reference to the fact that sudden strong emotion, fright, or shock, are liable to produce very injurious effects on the heart, and medical men have ample opportunity of observing how prolonged anxiety or mental overstrain often impair the muscles and nerves of the heart. Von Frey, in his physiological work, very correctly points out that one finds dilatation with cardiac hypertrophy as the result of continued physical overstrain in persons whose hearts had not been subjected to any other noxious influences. And it is just exactly to this fact that I should like to call especial attention. All the former allegations regarding chronic cardiac overstrain having thus been confirmed, the only question requiring further consideration is, whether severe bodily overstrain is capable of exercising a direct effect upon the heart—in other words, whether abnormally severe muscular strain can bring about acute cardiac dilatation.

First of all, I should here like to meet the objection that my cases were persons whose hearts were abnormal, debilitated, or suffering from functional alterations. I experimented on 14 robust youths and young men, from 14 to 34 years of age, and with many of them I frequently repeated the experiments. I have kept most of them under supervision for many years, and to the present day their hearts have remained healthy without exception. As before mentioned, Mendelsohn, Albu, Henschen and many others have recently confirmed the facts which I had established by percussion. Once more I must premise that the results I had obtained with percussion were corroborated by my radiograms in 1897. Not only did I find a cardiac dilatation, but also a change of form of the heart, which was oval *before* the experiments, whereas *after* the wrestling the dilated heart had acquired a more circular form, this with the diaphragm forced downwards. The left cardiac half, which did not reach the nipple line before, extended beyond it *after* the overstrain. The change of form as such is a fact. There might at most be a difference in the elongation of the transverse diameter due to shadow projection, but this cannot be of consequence, since by proper selection of the time of exposure, the person under exam-

ination being in the same position, the heart lies close to the anterior thoracic wall, so that really only the thickness of the chest wall would have to be considered. And now the question arose whether, and to what extent, orthodiagraphic examinations give us better results.

It is not to be doubted that the discovery of orthodiagraphy by Moritz means a progress in the examination and observation of the interior of the body, this being especially the case where it is a question of determining the size of organs at rest or of foreign bodies within the organism. But it is a different matter when it comes to the determination of the size of organs in motion, of which one wishes to make comparative observations at different times. Not only does this apply to the heart but to other organs as well, such, for instance, as the stomach or the intestines while in motion, etc. For we should not forget that every orthodiagram we obtain is the orthogonal, therefore the vertical projection of the greatest extension in one plane. This plane is invariably the same in the resting immovable body, and therefore in this way we always obtain the same exact size of this body. It is quite different, however, with organs whose position changes more or less, like the beating heart. And we shall see that it is exactly these movements of the heart that have to be considered in our experiments. In his extensive work on the subject, Guttman has already pointed out that with orthodiagraphy rotation of the body or changed position of the individual could, in repeated delineations or drawings of the cardiac boundaries in different planes, lead to differences of from 1 to 2 centimetres and more. Excepting a paper read by Hoffmann in a former congress, I nowhere find any indication that in the experiments made on men or animals the same attitude and position had actually been maintained during the orthodiagraphic examinations made at different times. This repeated use of the same canvas frame does not of itself offer any guarantee of an identity of position. Attempts have been made of late to obtain photographs of the heart with the shortest possible exposure, even in a fraction of a second, and also with the kinematograph. Apart from the fact that the resulting pictures are often wanting in clearness, we never know positively in which phase of the heart cycle such photographs were made.

Quite recently, in the course of my work at Nauheim, the two following cases, amongst others, have come under my notice, which exactly illustrate my theme. The first case is that of a medical colleague, aged 38 years, whose roentgenogram had been taken by medical men experienced in taking orthodiagrams, and

these skiagrams had shown an enlarged heart. The dilated stomach had displaced the heart outwards and upwards. As soon as normal conditions of the digestion were restored, the size of the heart was found by percussion to be normal, and there remained, without any other abnormality whatsoever, only a simple neurosis of the heart, which simple treatment by means of baths, exercises with resistance and massage, speedily improved. The second case is that of a Russian lady, aged 44 years, who has for several years had myocarditis on a basis of diabetes, with the heart dilated to the right and to the left. Both the mitral and aortic valves had systolic murmurs. In addition, there were pronounced symptoms of angina pectoris; yet in spite of all this the orthodiagram taken in Berlin, as also the electrocardiogram showed absolutely normal conditions.

* * * * *

I have already on former occasions called attention to the fact that in order to avoid errors it was necessary to resort to the use of exact marks on the persons to be examined, and in certain cases to fixations that do not interfere with the respiration. It is exactly this which is shown in the heart silhouettes in de la Camp's work, and which were made according to the rules laid down by Moritz. Not only does, as de la Camp states, a changed location of the diaphragm and increased thoracic circumference after wrestling take place, nay, the subject under examination, after the experiment, has actually taken an entirely different position relative to the apparatus. This is clearly evident from the fact that the position of both nipples, relative to a hypothetical horizontal plane, is different before and after the wrestling, this difference allowing a fourfold decrease in size of the heart silhouette amounting to $1\frac{1}{2}$ centimetres. In other words, the second results were obtained in an entirely different plane from the first ones, and therefore, even for this reason, they are not to be considered as conclusive. The drawings published by Aug. Hoffmann cannot be accurately judged of, since neither the right nipple nor the location of the diaphragm is depicted in them. After all that has been said, it is hardly necessary to maintain that, in view of the possibilities of such great sources of error, we are still far from being able to determine the superficies of the heart within one single square centimetre, or its contents in a quarter, half, or in a whole cubic centimetre. But, as we shall see further on, the possibility of other sources of error will also have to be considered.

A number of further observations have been reported meanwhile by other authors, and these are likely to throw more light on the question of overstraining of the heart. According to the

orthodiagraphic examinations by the three investigators mentioned, it appeared as if great interference with the cardiac functions, changes which, in his experiments on dogs, de la Camp produced artificially in the cardiac valves as well as in the heart's muscular apparatus, had no immediate deleterious effect. And yet the observation of such changes in men should already lead to misgivings, for great dilatation follows acute valvular inflammation. To give a few examples. Beck, in his work, "Touring and the Heart," reports on 31 young men, in 28 of whom he had occasion to observe the immediate effect of mountain-climbing. We are, above all, interested in his statement that there had been no previous illnesses, and that mountain-climbing, which simply produced palpitation and shortness of breath, was followed not only by cardiac symptoms but also immediate dilatation, which he was able to demonstrate by percussion, in one case even by radioscopy. He saw, just as I did, such dilatations disappear in a very short time, often after a few minutes, and he shares my opinion that it is only a matter of over-accumulation of blood within the heart cavities. Beck reports other cases in which the dilatation persisted for a longer time, though in the healthy heart never longer than until the following day. But he also saw cases where, solely through frequently repeated mountain-climbing, in persons that otherwise had always enjoyed perfect health, the picture of myocarditis as well as that of mitral insufficiency developed itself. Stachelin, in his observations on Swiss recruits, also pointed out that mountain-climbing may lead to acute dilatation of the heart in previously healthy young men, while Düms shows how, simply on account of the severer strain to which soldiers are subjected nowadays, the number of cardiac affections is on the increase in the armies of the different countries. Beyer attributes this evil to the ever-increasing indulgence in the sport of bicycling.

Two years ago Baldes, Heichelheim, and Metzger reported the observations they had made on a number of young men, otherwise in excellent health, after a march of 100 kilometres (60 miles) in one day. In a relatively large percentage of the examinations, by means of percussion of the absolute heart limits, they found dilatation. It is especially to this work that I shall have occasion to revert again. The number of observations on the influence of bicycling on the heart is especially large, and the deleterious effect of this sport is confirmed by nearly all of them. This is particularly evidenced in racing, where heart troubles have been observed in relatively large numbers, also in cases where no other injurious factor was present. But in oppo-

sition to these observations we again have others, in which, even after very strenuous physical labor, no enlargement of the heart could be demonstrated, whether by percussion or by radioscopy. I only refer here, among others, to the investigations of Pfeiffer, published a few months ago, which he conducted on men, partly after protracted marches, partly after bicycling tours. In this category also belong the observations of Schieffer, to which I shall shortly revert. But the objections are by no means exhausted herewith. Even diminution in size of the heart after overstrain was found by means of orthodiagraphic examinations, such, moreover, as could not possibly be attributed to changes of position of the diaphragm—for instance, the examination made on swimmers by Kienböck, Selig, and Beck, and which led to the risky theory that the heart was relieved by the increasing flow of blood to the abdomen.

This conflict of opinion grows in importance if we consider the following facts: Dr. Baldes, Dr. Heichelheim, and Dr. Metzger kindly allowed me to avail myself here of the results of their unpublished experiments. These gentlemen last year determined the heart limits on healthy persons, orthodiagraphically, before and again after a march of 100 kilometres in one day. Moreover, these orthodiagrams were made with the diaphragm in the same position, partly by an expert official of the United Electrotechnical Institute of Frankfort o/M., Aschaffenburg, and partly by Dr. Baldes, who for two years almost daily made radiograms with Rieder in Munich. And now, instead of the enlargement of the heart formerly made apparent by percussion, they found a reduction in size. The copies of their orthodiagrams, which you see here, show very changing pictures. Sometimes we notice an enlargement of the right cardiac half with a reduction in size of the left half, then again the reverse is the case. But most striking above all is the great difference of form in the heart before and after the march. Particularly instructive is the case of a man who had made a very quick run of several hundred metres and had been orthodiagraphed while laboring with dyspnoea. The enlargement of the right half of the heart amounts here to 1 centimetre. On the other hand, the left half not only shows you a transverse diameter reduced by 3 centimetres, but the totally changed and flattened form makes it evident that the orthodiagram of this heart was taken in an entirely different plane after the run than before. The difference in position of the nipples, relative to each other, in the pictures taken before and after the march, argues in favor of this. Like those of Hoffmann, all these

orthodiagrams were made while the person under examination was in the erect position.

Last year a paper was published by Dietlen and Moritz, according to which they also found smaller hearts after bicycling. This paper exactly proves that it is by no means sufficient to register the results of orthodiagraphic examinations; also that orthodiagraphy of the quickly beating heart is still far removed from constituting an unobjectionable method for the determination of its size. Disregarding the fact that in these examinations by Dietlen and Moritz, it is not conclusively proved that the cardiac diameter obtained before and after bicycling represent identical cardiac planes, the cases described do not at all come under the head of genuine acute overstraining of the heart such as I produced in my experiments. As evidenced by the communications themselves of both-named authors, their subjects of experiments did not have any albuminuria or apparent palpitation, as found by other authors, neither did any dyspnœa develop itself during the entire trip. Judging from this, there may have been a straining involving a quicker pulse, also great fatigue, but a real overstrain was out of the question. And yet this is of capital importance.

Schieffer, who works in Moritz's clinic, did not, with orthodiagraphy, find any change in the heart whatever immediately after bicycling. Regarding the degree to which the straining was carried, whether or not to the extent of dyspnœa, he fails to impart any information. So that here also there is no agreement between the facts as found and the orthodiagraphic examinations already mentioned. Yet this ought to be the case, were it not that, so far as the beating heart is concerned, orthodiagraphy shares with other methods of examination the disadvantage of inherent sources of error.

Last autumn, and before I had any knowledge of the investigations above mentioned, I began to verify orthodiagraphically the results of my former experiments on acute overstraining of the heart. Again I had the wrestling and resistance exercises performed by men in absolute health, of unobjectionable health record, whose hearts exhibited normal limits and normal functions. The dispositions were exactly the same as in my former investigations. Measurements and drawings were taken only after excessive dyspnœa, profuse perspiration, palpitation, etc., had manifested themselves. Examinations of the blood pressure and sphygmographic drawings were dispensed with, their results being sufficiently known. The radiograms were obtained in St. Mary's Hospital in Frankfort o/M., partly by the director of

the hospital's Roentgen cabinet, Sanitätsrat Dr. Schmidt, partly by Mr. Dessauer, director of the United Electrotechnical Institute of Frankfort o/M., Aschaffenburg. They were made with Dessauer's trochoscope-orthodiagraph, it being claimed that this apparatus furnishes the most reliable results.

And now, before closing, I should like in a few words to revert to the question as to what might be the causes that led the several experimenters to such different results regarding the dimensions of the heart in cases of acute overstraining. First of all, we have to consider the circumstance that the determination of the cardiac dimensions may have been made under very different conditions. One investigator, for instance, may have examined during the period of pulmonary inflation; another one, perhaps, after the heart's dilatation had already diminished; while a third one may have determined the maximum cardiac extension while the heart muscle was in the state of greatest relaxation. Of course, it is evident that anyone who did not take part cannot render a reliable verdict on the correctness of the several results of percussion. True, the observations, as well as the nature of the experiments themselves, often differ so much that it is difficult to compare them with each other. To illustrate: Zuntz and Schumberg examined soldiers who had climbed high mountains, laden with accoutrements, until difficulty of breathing ensued, and found, while simultaneously testing the inferior pulmonary limits, dilatations in the transverse cardiac diameter amounting to 2 to 3 centimetres, which results Staehelin confirmed. How different the result in Altschul's cases, of which he himself was the first subject of experiment. Namely, after he had bicycled a considerable time on a bad road against a strong head wind I noted—and so did he—marked cardiac dilatation. On the other hand, he himself, a trained tourist, hardly found any cardiac changes at all in himself or in other trained tourists after a long stretch of mountain-climbing. To be sure, they were also not troubled with any particular difficulty of breathing. Again, we have the very opposite in the results arrived at by Beck, the men he experimented upon having scaled steep mountains until dyspnoea set in. And just compare Pfeiffer's results of his experiments on the effects of protracted marches with those of Baldes, Heichelheim, and Metzger, also those obtained on bicyclists by Pfeiffer with those of Albu.

The cause of the divergence between the experimental results can be traced without any great difficulty, for according to the physiological researches of later years the heart is constructed in

such a manner as to represent the most perfect motor with which we are so far acquainted, so that it is capable of answering to the smallest stimulus with a maximum development of power. Moreover, it possesses the faculty to adapt itself to changed demands. Thus, for instance, the dog's heart is capable of taking in six times its normal quantity of blood, and yet the left ventricle succeeds in overcoming this amount and contracting again completely. Certainly the heart's work increases enormously in overcoming such obstacles, and the increased intra-cardiac pressure must also be taken into account. But it is a well-known physiological fact that the dog, as far as the heart is concerned, can be subjected without detriment to considerably greater and longer hardships than the human organism, although fortunately the latter also possesses in its cardiac muscular apparatus and in its vascular system all kinds of temporary compensatory arrangements. And to these compensatory powers it is due, as I particularly stated in my first report, that the limits of over-expansion of the healthy heart may lie far apart in the muscularly strong individual. At the same time we see, nevertheless, that the qualities of the heart as a muscle manifest themselves, and to these also belong laxity and expansion as a consequence of excessive strains.

My Lord Duke, Ladies, and Gentlemen, I am firmly convinced that every physician, especially here in England, who has the opportunity to observe a considerable number of cases of heart affections will easily find confirmation of the fact that in individuals previously normal, and solely through the most different forms of overstraining, the heart may be brought first to acute dilatation, and finally through its repetition to permanent dilatation, with all its consequent phenomena.—*Lancet*.

THE INFLUENCE OF ALCOHOL ON IMMUNITY.*

BY PROF. TAAV. LAITINEN, M.D.,

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Member of the Finnish Academy of Science.

Modern researches have done much to explain the extent and nature of the protective powers by which the organism endeavors to defend itself against the attacks of all kinds of injurious agencies, and especially against invasion by the germs of infective diseases. It is now a well-established fact that alcohol weakens the normal resisting power of the body against the above-named disease-producing influences. In the hope of contributing something to the explanation of the way in which alcohol weakens the organism, I have made a number of experiments bearing upon the question of the influence of alcohol on immunity.

Early in the present century careful experiments went to show that alcohol certainly had some influence upon immunity. Two Americans, Abbott and Bergey, were the first to discover that this agent produces a diminution of the hæmolytic complement in the blood-serum of certain animals which were tested. They showed also that the formation of specific hæmolytic receptors (immune bodies) may be retarded by the action of alcohol. C. Fraenkel, however, asserts that both large and small quantities of alcohol exercise a definite stimulant action upon the formation of the immunising bodies.

R. Trommsdorff has described a retarding influence exerted by alcohol upon the formation of agglutinins in guinea-pigs. Rubin speaks of the negative action of alcohol upon phagocytosis in the case of staphylococcus, streptococcus, and pneumococcus, E. Stewart has noted the effects of alcohol upon the opsonic index for tubercle bacilli and also streptococci.

Almost similar results have been obtained by P. Th. Müller, Friedberger, and others in regard to the influence of alcohol on the protective qualities of the blood generally.

I stated in a paper read at the last International Congress on Alcohol, held in Stockholm in 1907, that alcohol, even in small quantities, causes a diminution of resistance of red blood corpuscles against a heterogeneous serum. I also then stated that I had begun a series of further investigations relating to

* Abstract of the Third Norman Kerr Memorial Lecture, delivered in connection with the Twelfth International Congress on Alcoholism at the Victoria and Albert Museum, South Kensington, London. Tue day, July 20th, 1909.

the question as it concerned the human body. The result of these researches up to the present time I now present in this Norman Kerr Memorial Lecture. The persons experimented upon numbered 223, beginning with myself. They were of different classes and ages. There were medical professors and other physicians, university Fellows, students of both sexes, hospital nurses, school teachers of both sexes, waiters, and other men and women of the working class. My studies have been directed to an investigation of the following points:—

1. I sought to ascertain whether the resistance of human red blood corpuscles against a heterogeneous normal serum or an immune serum can be diminished by the use of alcohol.

2. I have studied the action of alcohol in drinking and abstaining persons on the hæmolytic power of blood-serum over heterogeneous red blood corpuscles (rabbits). I have studied not only the hæmolytic power of the human blood-serum, but also its power of precipitation in the presence of rabbit-serum, with a view to ascertain if the reaction between a known dilution of rabbit-serum and a certain dilution of serum of alcohol-users and non-drinking persons is different or not, and if the reaction is more apparent with the former or with the latter.

3. The resisting power of serum obtained both from alcohol-drinking and from non-drinking persons was further tested by human blood, with the object of discovering whether any difference in reaction existed between the same immune serum and the two kinds of human sera above-mentioned.

4. I have studied the problem as to whether the hæmolytic complement in the blood-serum of alcohol-drinking and non-drinking persons is altered in any way by alcohol.

5. The bactericidal power of blood-serum from both alcohol-drinking and non-drinking persons was determined by some experiments.

The above experiments have given the following results:—

1. The normal resistance of human red blood corpuscles appears to be somewhat diminished against a heterogeneous normal serum or an immune serum by the consumption of alcohol, provided that tolerably large equal, or nearly equal, numbers of drinkers and abstainers of both sexes be examined, and the average of resistance be taken on both sides, this last-named precaution being necessary because the resistance of red blood corpuscles from different human beings varies largely. The difference is often greater when using weaker dilutions than when using stronger dilutions of lysin.

2. These experiments have shown the normal hæmolytic power of human blood-serum to be less in the case of alcohol-drinkers than in that of abstainers.

3. The precipitating reaction between a solution of 1 per cent. human blood-serum and different dilutions of immune serum (obtained by immunising the animals with blood-serum) was greater in the case of drinkers than in that of abstainers.

4. The complement action of human blood-serum, according to these experiments, was greater in the stronger dilutions (0.4 to 0.04) and less in the weaker dilutions (0.2 to 0.0004) in the case of drinkers than in that of abstainers; it was not, however, much affected.

5. These experiments have also shown that the bactericidal power of blood-serum against typhoid bacteria was less in the case of drinkers than in that of abstainers.

It seems clear, therefore, that alcohol, even in comparatively small doses, exercises a prejudicial effect on the protective mechanism of the human body.—*Medical Press and Circular*.

THE TREATMENT OF THE STOKES-ADAMS SYNDROME.*

BY REYNOLD WEBB WILCOX, M.D., LL.D.,

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The title of this paper may be misleading in that there is, strictly speaking, no treatment of a syndrome, but rather, of the underlying lesions of which the syndrome is the expression, and of the patient presenting these symptoms.

Definition.—The syndrome consists of (1) bradycardia, (2) cerebral attacks and (3) pulsation of cervical veins in excess of pulse rate (Stokes, 1846; Adams, 1827).

Pathology.—In a few cases so-called uræmia may be present. The symptoms suggest vascular disease of the cerebrum analogous to intermittent claudication (Huchard, also Gibson and Jaquet, 1904) or disease of the medulla (Charcot). It may be the result of various infections, intoxications, or, possibly, of prolonged use of digitalis.

Pathological anatomy.—Stokes' original opinion was that there was always (1) organic disease of the heart muscle. Some

* Read before the American Therapeutic Society.

instances were inexplicable after careful *post-mortem* examinations, and so remained until the suggestion of Gaskell's bridge (1883) and the discovery of the column (bundle) of His (1893) and the work of Erlanger (1905, also Humblet and Hering) who demonstrated the results of interference with it. To (1) should be added (2) localized disease of the column of His which may be sclerotic change in the endocardium, gumma, cartilaginous tumors, fatty infiltrations, with atrophy, or endarteritis in its artery, and (3) dromotropic inhibition of pneumogastric resulting from various lesions.

Symptoms.—To those cited in the definition of the syndrome others must be added:

1. Cardiac; precordial oppression, pallor, anginal pain, sweating, syncope.

2. Cerebral; consciousness suddenly and completely lost, vertigo, epileptiform convulsions often preceded by an aura (olfactory gustatory, auditory or tactile), apoplectiform attacks not followed by paralysis during or after them.

3. Respiratory; stertorous breathing, rarely apnoea, sometimes Cheyne-Stokes breathing. Lassitude after the attack is pronounced.

Signs.—Palpation of the cervical veins will show a difference between their pulse-rate and that of the radial artery. The stethoscope will determine auricular systoles in greater frequency than the ventricular, and, finally, the fluoroscope will give visible confirmatory evidence.

Diagnosis.—Strictly speaking, the Stokes-Adams syndrome should not include those instances of bradycardia due to infections or intoxications. If these can be excluded and arteriosclerosis, especially of the coronaries, is believed to exist, the diagnosis should be clear.

Prognosis.—This is uncertain, many die in the attack. Others recover and may live for years. If a syphilitic history is obtainable, the outlook is much more favorable.

Treatment.—(1) Prophylactic; avoidance of fatiguing exercise, emotional excitement, ingestion of copious and indigestible food, all of which have been assigned as valid causes. (2) Mechanical; if cerebral symptoms are associated, the body should be inverted, since, in some instances, bulbar anemia may cause heart block. (3) Medicinal; this must be based upon Erlanger's observations, which demonstrate that, in complete heart block, stimulation of the vagus has no effect, but when the accelerator is stimulated, the rate of both auricular and ventricular systole is increased. This rate is not affected by variations of general blood pressure, by asphyxia or interference with the ordinary

circulation. This would seem to exclude the use of the glyceryl nitrate group, which is not successful, and the digitalis group, which would likely do harm. Of the remedies which increase the rate of cardiac beat, those mostly studied as to their effect on the ventricle, are atropine (hyoscyamine daturine, duboisine), cocaine and saponin. The following, which also increase its force, ammonium salts, alcohol (ether. chloroform), cactus, arsenical salts, quinine and strychnine, should be cited. Drugs which are known to act upon the accelerator centre are ammonia, caffeine, picrotoxin, cactus and staphisagria. Obviously, many of these drugs present disadvantages, or are not of pronounced action, so that they may be excluded from consideration.

Usually a combination of atropine for diminishing the tone of the vagus terminations, in conjunction with strychnine for increasing the force and frequency of the ventricular systoles, has been advocated. Of course, atropine is useless in affections of the myocardium of which the syndrome is the expression. Alcohol has at times apparently shortened the duration of the attacks. Theoretically cactus, which is found to both increase the force and rate of ventricular systole, as well as to act on the accelerating centre, is indicated. Practically, in those instances in which I have employed it, recovery from the attack and subsequent attacks, has taken place. In the urgency of the symptoms, and they so appear, it should be preceded by ammonia and the gravity of the syndrome warrants its use by hypodermatic injection. The fluid extract is the only preparation of cactus which is recommended, and active specimens are readily obtained at the pharmacies. The dose is thirty minims every hour or two, so long as may be required. After the acute attack is under control, it is well to administer arsenic iodide, in doses of one one-hundredth to one one-fiftieth of a grain, thrice daily, for a considerable period of time.

Since gummata have been frequently found on *post-mortem* examination, involving the column of His, inunctions of oleate of mercury, or better, for immediate results, hypodermatic injections of red mercuric iodide, in one per cent. solution in sterilized oil, in one-fourth grain doses daily should be administered. The insoluble mercury salts have not yielded so favorable an outcome in my hands. In these instances mercury is useful, no matter how much time has elapsed since the primary lesion. In addition to, and contemporaneous with, the mercury, strontium iodide should be administered, increasing up to massive doses.

In addition, a careful study of the patient should be made, and all other pathological conditions carefully studied and, so far as is possible, rectified.—*Monthly Cyclopædia.*

Progress of Medical Science.

MEDICINE.

IN CHARGE OF W. H. B. AIKINS, F. A. CLARKSON, AND BREFNEY
O'REILLY.

Neuroretinitis from Typhoid Fever.

These cases are rare. Clothier declares that out of 200 cases of optic neuritis investigated by Kampberstein, most of them were caused by brain tumors, syphilis, tuberculosis, brain abscesses, meningitis; but in none was the cause typhoid fever. Carpenter has reported two cases of mild bilateral papillitis, due to typhoid fever, in girls of seven and eleven years of age. Both recovered. Reitter and Louber have reported a case in which, during typhoid fever, there was neuritis of the external papillae and then neuritis in the left eye, with recovery in three weeks. Sourdille has reported three cases of papillitis with involvement of the central vessels, during typhoid fever. All recovered.

Clothier claims that the visual disturbance is due either to the effect of the toxins on the nerve elements or to vascular changes.—Translated from *Gio. Internaz.*, by Harley Smith.

Typhoid Agglutination in Tuberculosis.

In some patients treated in Strasburg Hospital the serum diagnosis of Widal having been tried, there was obtained agglutination of the typhoid bacillus, although the further course of the disease or the autopsy proved that they were cases of tuberculosis.

Subsequently special observations were made in a series of cases of tuberculosis. These cases, most of which were severe, were 26 in number, and in none of them did the history show a previous typhoid infection. The test of agglutination was made not only on the typhoid bacilli, but also on the para-typhoid A and B. The reaction was considered positive only when it was produced at a dilution of 1 in 100 and was confirmed macroscopically. Of the 26 cases, 8 gave a positive reaction (six times with the typhoid bacillus, once with the para-typhoid A, once with the para-typhoid B). In four other cases the agglutination

was produced at a dilution of 1 in 50. In two of these cases a first trial gave a negative result, but in further observations the reaction became positive.

From these tests, it follows that the significance of the Widal reaction is not absolute, as the agglutination of the typhoid or of the para-typhoid bacilli takes place somewhat frequently in cases of febrile tuberculosis.—Translated from *Giorn. Intern.*, by Harley Smith.

Digipuratum.

In an interesting article on "Digitalis and the Digitalis Group," Robert Tissot, of Chaux des Fonds, Switzerland, writes of digipuratum Knoll: This is an extract of digitalis leaves from which the inert and irritating constituents have been removed, as is the case with digitonin, for example. This extract is tested by physiologic experiment on the hearts of batrachians; its action consequently is always uniform. One decigram ($1\frac{1}{2}$ grn.) of digipuratum acts the same as 1 decigram of active digitalis leaves. Its action is rapid and it produces no gastro-intestinal disturbances.

A pastil of 1 decigram constitutes a single dose. As an asystolic dose it is best to give four pastils the first day, three the second day, three again the third day, and two the fourth day, each dose half an hour after eating. Subsequent doses should be adjusted according to values, to wit: 1 decigram of digipuratum is equivalent to 1 decigram of the very active leaves. According to the author's experience, which is extensive, the digipuratum of Knoll is the digitalis par excellence when time is not pressing too much and when one may choose the gastric route. This remedy contains practically all the active principles of digitalis. This is a great advantage, because, according to a well-known biologic law, several agents acting in the same way are better and are less toxic than a single agent whose activity would be equal to the combined activities of the remedies constituting the mixture.—*Amer. Jour. Clin. Med.*

The one lesson learned from the trypsin treatment of carcinoma is the beneficial effect of trypsin on many varieties of chronic ulcer. It may be employed, without danger, in the form of applications to the surface of the ulcer.—*American Journal of Surgery.*

OBSTETRICS AND GYNECOLOGY.

IN CHARGE OF ADAM H. WRIGHT, K. C. M'ILWRAITH, FRED. FENTON
AND HELEN MACMURCHY.

Missed Labor. Peter McEwan, M.A., M.B., F.R.C.S. Edin.
(*Lancet*, June 29, p. 1826).

A married woman, aged 29, was admitted to hospital on October 24, 1907, suffering from "abdominal tumor." Menstruation had been regular until October 19, 1906, when it ceased. Her abdomen enlarged, milk appeared in the breasts, and she felt quickening. She had morning sickness and thought herself pregnant. The abdominal swelling gradually increased and the amenorrhoea persisted until May 19, when there was a flooding followed by a slight reddish vaginal discharge, occasionally offensive, for 10 weeks. Since then two normal periods occurred—in September and early in October—but the loss was slight. She had had a feeling of weight in the pelvis, mainly on the right side, for the previous 5 months, and her strength did not return satisfactorily. Her abdomen diminished in size from May 19 onwards. She had two children, 6 and 7 years old respectively, and had had one miscarriage (at 3 months) four years ago, after which she was curetted.

There was a slightly hectic flush on the cheeks. The mammae were large and lax and showed a well-marked areola and secondary areola; no milk could be expressed. The abdomen was distended to about the size of a 7 months' pregnancy. A rounded tumor was felt rising out of the pelvis and extending about three fingers' breadth above the umbilicus. The upper limit of the swelling was rather higher on the right than on the left, and its lateral margins were 1 inch from the right and $3\frac{1}{2}$ in. from the left anterior superior iliac spines. The tumor as a whole had slight lateral mobility. It was firm, and in the right loin hard rounded bodies could be felt and crepitus obtained. The cervix was firm and slightly mobile; the os admitted the finger-tip; the body of the uterus could not be felt apart from the rounded mass which filled the upper part of the pelvis and constituted the lower portion of the rounded abdominal tumor. There was a brownish discharge, slightly offensive. The temperature was 103.6° , the pulse was 130, and the respirations were 30. The tongue was coated. A vaginal douche was given thrice daily.

The temperature remained high, with morning remissions.

ranging from 98 to 103.6 deg. Difficulty was experienced in attempting to pass the sound. Under ether it passed into the uterus for 6 or 7 inches. The cervical canal was dilated first with Hegar's dilators, then with Bossi's dilators, slowly and gently. The hand was passed into the uterus and the shoulder of the fœtus was found presenting. The uterine wall was felt to be intact. The arm of the fœtus was pulled down; the head was cut off with a sharp hook; the body and then the head were extracted easily; the cord remained attached in utero. Much dirty, offensive fluid escaped. A coil of small intestine appeared at the vaginal orifice. It protruded from a rent in the posterior part of the lower uterine segment, slightly to the right of the middle line. The intestine was pushed up. The abdomen was opened by median incision. The omentum and bowel presented. A large, flabby uterus, necrotic, adherent to the intestines, was exposed. It showed no sign of contraction, and was very thin, except in the region of the placenta. The necrotic wall had given way in several places, besides that felt per vaginam. The upper part extended as far as the under surface of the liver, to which it was adherent. The uterus was dissected off from intestine and omentum; parts of the latter being necrotic were removed. A portion of the uterine wall was too closely adherent to be removed with safety, and the surface was pared with scissors. The uterus and ovaries were removed and few bleeding vessels were tied. Some necrotic tissue adherent to the under surface of the liver was scraped, and a drain was left in the loin. The abdominal cavity was thoroughly washed out with saline solution. A packing of iodoform gauze was left as a vaginal drain and the abdominal incision was closed with through-and-through sutures of silkworm gut. Near the end of the operation the pulse failed, and in spite of stimulation death occurred at the end of 15 hours.

The placenta was firmly adherent. Only here did the uterus show anything approaching normal thickness; in other parts it was exceedingly thin and yellowish, and tore readily; there was no obvious muscular structure. The upper part did not bleed when torn. The fetus was not much short of term.

Missed labor is so rare that the diagnosis was not made until the sound had been passed into the uterus. No reason was found for the flooding and offensive discharge on May 19, when there was apparently an attempt at premature labor. The uterine wall, except at the placental site, was exceedingly thin and friable, and incapable of any attempt at contraction or at being manipulated even gently without tearing. Consequently, the

treatment usually advocated, and tried at first—dilatation of the cervix uteri and the removing the contents of the uterus per vaginam—was inadvisable. It appeared impossible to deliver the fetus per vaginam without rupture of the friable uterus. Had abdominal section been performed first of all, the patient would have had a better chance.

Dr. A. Dempsey (*Brit. Med. Jour.*, Sept. 19, 1908) has recorded a case of missed labor in which he dilated the cervix and emptied and washed out the uterus. The patient was seven months beyond term and made a good recovery.—*The Med. Review*.

Motor-car Miscarriage.

Among the frequent causes of abortion is direct mechanical violence. This is operative in proportion to the severity of the injury inflicted and the condition of the endometrium on which the ovum is implanted. When this is healthy and the ovum also, the patient will withstand considerable violence without abortion. A great shock or injury is sometimes better borne by pregnant women than frequency of repeated shock. A familiar example of this is found in abortion following the use of a sewing machine driven by the foot. On the other hand, a patient may sustain a severe fall, fracturing a limb, and not abort.

The presence or absence of consciousness when the injury is received has also a distinct bearing. Under anaesthesia pregnant patients bear operations of considerable magnitude without the interruption of gestation.

The use of a motor car is so common that abundant opportunity is afforded to study the effects of its use upon the health of patients. In the early months of pregnancy motoring is frequently followed by abortion.

Edward P. Davis (*New England Medical Monthly*, May) cites at a meeting of the Obstetrical Society of Philadelphia two illustrative cases, and continues:

“The reason why motoring should be dangerous to patients in early pregnancy seems to lie in the fact that the rapid motion of a motor car subjects the patient to very frequent small jars. These are more or less violent in proportion to the character of the road and the rapidity of the car and the ease with which it works. If the patient sits upon the rear seat of a large car, the motion is usually greater and the shock received in passing over an obstacle much more than if she sits in front. In the latest cars the weight is so distributed that the back seat is more comfortable than in the older models. No matter how smoothly the motor car runs, unless it were upon a track its motion cannot be

as uniform and smooth as that of a railway train; hence the greater danger to which it exposes the patient.

“The characteristics of abortion following motoring are its slow and insidious development without bright hemorrhage and pain, the ovum evidently separates from the wall of the uterus very gradually, blood is extravasated and not poured out, and pain is not excited until the uterus is so distended with blood clot that it is made to contract.

“While motoring is dangerous in early pregnancy, in the latter months of gestation, with reasonable precautions, it may prove exceedingly useful. As a means of obtaining fresh air and inducing sleep during the heated months it is most beneficial if patients can be induced to use reasonable precautions against shock, fatigue and chilling the surfaces of the body.”—*Med. Review of Reviews.*

A Plea for a Rational Puerperium.

SIR,—Dr. Haultain’s suggestion that the rule of keeping the puerperal patient in bed for several days after her confinement is a lingering relic of the taboo practice of secluding the woman until a rite of purification has been performed is very interesting.

Rest in the recumbent position, spare dieting, and seclusion characterize the treatment of women both during menstruation and the puerperium all over the uncivilized world, for the reason that during these times a woman is looked upon as a dangerous person. This we have all heard about. But what is not so well known, perhaps, is that there are several exceptions to the rule. And the exceptions will, I am sure, prove interesting to your readers, because they seem to forestall von Alvensleben’s effort to reform the present practice.

Among some races the patient is expected to get up and walk about after the child is born; among others she is made to occupy a sitting position. This is done, we are told, not out of ignorance or carelessness, but deliberately, in order to facilitate the lochial discharge. The following races, among others, practise or have practised this treatment: The Germans (of the twelfth century), the Chinese, Japanese, Abyssinians, and certain American-Indian tribes.

It seems to be the case, and the delay of this reformation (if it be a reformation) until the present time exemplifies it, that midwifery is the most conservative as well as the most ancient branch of medicine.—I am, etc.,

London, W.

DAN. M’KENZIE.
—*Brit. Med. Jour.*

Fatal Case of Pernicious Vomiting of Pregnancy.

Dr. Drummond Maxwell (*Journal of Obstetrics and Gynecology for the British Empire*, May, 1909) reported this interesting case before the regular meeting of the Obstetrical Section of the Royal Society of Medicine:

The case occurred in a primigravida, æt. 26. The chief features of interest in the case lay in the difficulty of diagnosis, since the patient, after admission to hospital, ceased vomiting, and there was only the history of severe vomiting at home, unassociated, however, with marked wasting. The toxic nature of the case did not reveal itself in any characteristic alteration of the urine; there was no albuminuria; the only ominous signs on admission were drowsiness and a very rapid, weak pulse; there was no jaundice. Patient passed successively through stages of restlessness, delirium, mania and final coma. Autopsy revealed hyaline degeneration and necrosis of the central cells of the hepatic lobules, the kidneys also showing a severe parenchymatous nephritis; sections of both tissues were shown under the microscope. The diagnosis of this distinctly atypical case was uncertain during life, and was based finally on the pathological investigation post-mortem.—*Review of Reviews*.

Extract of Corpus Luteum in Disturbances of Artificial and Physiologic Menopause.

Morley, in the November number of the *Journal of the Michigan State Medical Society*, reports his results in 18 cases. This report is a continuation of the one that appeared in the August number of the *Detroit Medical Journal*. The author used an extract made from the corpora lutei of beef ovaries rather than an extract of the entire ovary, as the consensus of opinion seems to be that the internal secretion of the ovary is produced by the yellow body. The extract is given in five-grain doses, three times a day, one-half to one hour before meals. His results in 18 cases may be summed up as follows:

Five were cured, 12 were improved and one obtained no relief. Included in the 12 cases that were improved are grouped those that are still taking the extract. A permanent cure may result in a few of the cases under treatment. Of the 18 cases, 14 suffered from disturbances of operative or artificial, and 4 from those of natural or physiologic menopause. While the results obtained in so small a group of cases do not warrant the drawing of any definite conclusions, still the author thinks that the results are favorable enough to justify a continuance of the treatment in other cases, where there is a disturbance incident to artificial or physiologic menopause.

OPHTHALMOLOGY AND OTOTOLOGY.

IN CHARGE OF J. T. DUNCAN.

The Prevention of Blindness.

The importance of this subject is again brought before medical men by an article by Bull, in the *New York Medical Journal*. When it is remembered that about *one-fourth* of all cases of blindness are caused by the ophthalmia of the new-born, and that this can be almost absolutely checked, so as to prevent blindness, the responsibility of all who attend at confinements is very great. Fancy a human being hopelessly blind during its whole life, just because of carelessness or ignorance during the first few days of an infant's life! And the danger can be so easily prevented!

Bull reminds us that the various steps in the preventive treatment introduced by Professor Credé are as follows: For several days before the expected confinement the vaginal passages of the woman are carefully irrigated by some antiseptic solution, preferably mercuric bichloride, in order to remove as far as possible all infectious secretions. It is not possible to render these passages thoroughly aseptic, but they can be made relatively so. As soon as the child has been born, the face and scalp should be cleansed with sterilized water, especially about the eyelids. The eyelids should then be opened and one drop of a two per cent. solution of silver nitrate should be dropped into each eye from an aseptic dropper or a glass rod. But little reaction usually follows, but should it occur, it can be readily controlled by cold compresses soaked in a two per cent. solution of boric acid or salicylic acid. If these precautions are adopted, the disease will generally be prevented.

So grave a calamity is blindness from purulent conjunctivitis that the use of this precautionary method has been urged at the birth of every child. There is no doubt of the wisdom of taking precautionary measures such as those of the Credé method. This plan of prophylaxis is at once simple, safe, and inexpensive, and if universally employed would have saved the eyes of many thousand children who because of this neglect have passed their lives in darkness.

Surely, then, a strong case is made for the universal application of Credé's method (or some modification of it, as noticed below).

Some, however, do not advocate its use in every case, but

depend upon notification and treatment after the disease has commenced.

The first essential in any movement of this kind is to bring about a public understanding of the conditions, and secure the sympathy and assistance of the people in our endeavors to carry it out. One powerful means of developing watchfulness and care is the publication in health bulletins of the dangers of infantile ophthalmia, and the possibility of its prevention. Then it is all-important to fix on an effective and satisfactory anti-septic, which can be used even by unskilled hands without causing damage. The author's own experience has taught him that, except where the disease already exists, a two per cent. solution of silver nitrate is too irritating and is likely to cause what is known as "silver catarrh." After a very large experience he now recommends a one per cent. solution as non-irritating and at the same time an effective bactericide. This solution can be employed by inexperienced physicians and ignorant midwives with perfect safety.

Extirpation of the Lacrymal Sac.

Charles S. Means makes it a rule to operate on the following classes of patients:

First.—Cataract patients who come from a distance and have neither the means nor opportunity for taking a long extended course of treatment before operation.

Second.—Nervous or hysterical patients who are unable to bear the passage of probes or even the use of the syringe. (One man I now recall fainted and was so sick he had to be removed to his home every time either a probe or a syringe was introduced.)

Third.—Children that are practically unmanageable, causing not only an endless amount of bother, but also a liability of injury to themselves by resistance.

Fourth.—Long persistent cases that have not responded to careful treatment.

Fifth.—Traveling or transient patients who would be compelled to be under a new physician almost constantly, running the risk of neglect and greatly increasing the expense.

Sixth.—Persons living in rural districts and unable to be away from home for long extended periods and financially unable to return to the oculist.

Seventh.—Where ulcer of cornea is present.

Eighth.—When malignant growths in the sac are to be feared.

Ninth.—When one eye has been lost and constant discharge endangers the remaining eye.

Refraction Cases in Cleveland.

In an interesting article on Refraction Cases in Cleveland, U.S., L. K. Baker (*Cleveland Medical Journal*) has the following suggestive statement in regard to glasses for indigent children:

This introduces the fourth general class, viz., indigents. Ten years ago teachers were instructed to investigate, to such extent as they conveniently could, the cases of poor children, mostly those for whom the Board of Education furnished books and shoes, and report their cases to the Supervisor of School Hygiene on the blanks furnished for that purpose. During the five years the writer looked after these matters, 300 (25%) of the teachers reported very close to an even thousand of these cases. The dispensaries all assisted in refracting these children. opticians sold us glasses at wholesale rates for them and the money to pay for the glasses was all subscribed by private individuals. It became such a task to get people to raise this money for us that I finally arranged with the Infirmary Department of the City Hall to investigate all cases reported indigent and pay for glasses if the pupils were found to belong to this class. Hence at any time during the past five years any child in the city whose parents really could not pay for glasses could be examined at a dispensary and get an order for glasses at the City Hall. Of this, all teachers, principals and district physicians were duly apprised. Last week Mr. Feltzer, bookkeeper at the infirmary office, was kind enough to look up their disbursements for glasses for indigents during the past five years. They are as follows:

September to January, 1904.....	paid for 15 pair
January 1, 1904, to January 1, 1905.....	paid for 26 pair
January 1, 1905, to January 1, 1906.....	paid for 13 pair
January 1, 1906, to January 1, 1907.....	paid for 45 pair
January 1, 1907, to January 1, 1908.....	paid for 42 pair
January 1, 1908, to September 1, 1908.....	paid for 15 pair

This is an average of 32 pair a year, or 156 pair altogether in five years.

Editorials.

ONTARIO MEDICAL COUNCIL.

A special meeting of the Ontario Medical Council was held Dec. 7-10, inclusive, to consider mainly three matters: (1) The "Roddick Bill" and proposed amendments. (2) Application to the Ontario Legislature for an "Enabling Clause" similar to that of the Province of Alberta. (3) Application to the Ontario Legislature for an alteration in the Medical Act, which would enable the Council to deal more rapidly with those guilty of illegal and criminal acts.

We are unable in this issue to give even a synopsis of the discussions at the meeting because, up to the time of writing, we have been unable to get a report of the proceedings. We are told that certain reports in the daily papers were neither complete nor correct. We hope, however, in our next issue, to give a complete report of the more important details, resolutions, reports of committees, etc.

It is rather interesting to note, in connection with the meeting of the Council, that physicians throughout Ontario are taking much greater interest in the work of the Council than they did two or three years ago.

The discussion on the "Roddick Bill" was certainly interesting. They discussed the whole bill and the proposed amendments very thoroughly, clause by clause. We are in a position to say that they accepted most of the amendments which were agreed to at the meeting in Montreal in November, with perhaps one rather important exception as to preliminary training and the standard of matriculation.

A decided pronouncement on this very important question is in itself a decided step in advance, although the goal sought for may still be some distance away. A legislation committee was appointed to confer with the Government or with members of the Legislature at the next session of that body. Considerable discussion took place respecting the status of certain representatives of the universities. There are now in the Council eight

so-called school-men—Dr. McCallum, Toronto University; Dr. Ryan, Queen's University; Dr. Moorehouse, Western University; Dr. Starr, Victoria University; Dr. Johnson, Trinity University; Hon. Dr. Sullivan, Royal College of Physicians and Surgeons, Kingston; Dr. Temple, Trinity Medical College, and Sir James Grant, Ottawa University. It is thought by some that only those universities which have active medical faculties should have representation in the Council.

Some very unpleasant rumors have been in the air respecting the irregularities, if not worse, in connection with payments of examiners. The methods of the Council in respect to payments of its members and examiners have been for many years exceedingly loose and unsatisfactory. We believe that this fact is now recognized by the majority of its members, and we expect that efforts will be made at the next meeting to improve matters in this regard.

WESTERN MEDICAL FEDERATION.

We published in our December issue a report of the proceedings of a meeting of representatives from the four Western Provinces of Canada—Manitoba, Saskatchewan, Alberta and British Columbia—held in Banff, September 28th. Dr. Spankie, from Ontario, was welcomed as a visitor, but took no active part in the discussion. The delegates recommended a Federation of the Western Provinces, but decided not to include Ontario in the Federation at present. They also recommended the appointment of an Examining Board for the four Provinces.

Since that time a committee of the Central Alberta Medical Association has taken one step in advance. The members of this committee evidently consider that such a Federation would not help Dominion Registration, and have expressed a decided opinion in favor of the Roddick Bill, with certain amendments. So far as we can learn, this Alberta committee holds views very similar to those expressed by members of the Ontario Medical Council at the last special meeting.

There are still difficulties in the way, but we do not agree with our pessimistic friends who think Dominion Registration is still *a long way off*, and that nothing of any consequence has been accomplished lately in the way of surmounting the obstacles which are continually arising as negotiations go on. We feel certain that a great amount of good has been accomplished during the various meetings held during the last few months, including those at Winnipeg, Banff, Edmonton, Montreal and Toronto. The men who are honestly devoting their energies on constructive work in the interests of our profession in the whole Dominion are increasing in numbers, and we hope that satisfactory results of their work will soon be in evidence.

THE RETIREMENT OF MISS SNIVELY.

The development of training schools for nurses during the last 50 years has been marvellous. It is practically impossible for one who knew nothing about the training of nurses up to five or ten years ago to have any adequate conception of the wonderful advances which were made in the latter part of the 19th century.

A most prominent figure in this development in Canada was Miss Snively, of the Toronto General Hospital. She was placed in charge when the training of nurses in that institution was in an unsatisfactory condition. Soon after her appointment there was a change, in fact a complete transformation. We think it will generally be conceded now that this Training School, during the last twenty years, has been the best in Canada, and perhaps in North America.

In most of the meetings and conventions of nurses and lady superintendents that have taken place on this continent during these years, Miss Snively has taken an important part, and has probably occupied more positions of honor in these various associations than any other one person.

She was a very strict disciplinarian, and her methods, in

the opinion of many, were rather harsh at times, and her supposed partiality for favorites was often commented on. The writer has no desire to discuss such details, but would prefer to acknowledge with gratitude that he often received invaluable assistance from her during the many years in which he was engaged actively in the work of the Hospital, and especially in the Burnside.

During her whole career in Toronto she always displayed very great ability and absolute independence. She feared *no man* nor no set of men, and the man or men who thought otherwise for a time, and acted accordingly, almost invariably failed to win out.

There was a large gathering at the General Hospital, Dec. 2nd, when a purse of \$1,000 was presented to Miss Snively. The Chairman of the Board, Mr. J. W. Flavelle, occupied the chair, and announced that the Hospital Board had decided to give her a retiring allowance of \$700 a year as a mark of their appreciation of her services to the Hospital during the last 25 years. Mr. Flavelle also expressed the regard in which Miss Snively was held by the Board. She asked a year ago to be relieved, but was requested to reconsider the matter and remain a few years longer. She recently again asked for relief, as the burden was becoming too heavy. No time was set for her resignation going into effect, but she wished to retire not later than next June.

HYDROPHOBIA.

A number of our Canadian folk left the Province of Ontario for our neighboring country south of us about the middle of December, under depressing circumstances. Eight people had been bitten by a mad dog in the town of Galt. Dr. Walker, a physician in Glencoe, 50 miles from Galt, was also bitten by a dog in his own village. About the same time there was another mad-dog scare in the village of Markdale. At least nine persons went to the Pasteur Institute, in New York, for treatment. Fortunately, the results in that institution have been exceed-

ingly satisfactory. Dr. Randaud tells us that there have been only three deaths out of the last 1,800 people treated there.

We live in a very prosperous and wealthy Province in the Dominion of Canada. We have what is called a progressive and democratic government. That government boasts of a big surplus. It also boasts that it spends a large amount of money for the education of the masses. It endeavors to educate the people in many directions. Its work in all these directions, both in the interests of human beings and the lower animals, is worthy of all praise. There are in this government two physicians. Might we ask these worthy men to bring a certain matter before the Cabinet? Although these men are well versed in matters both medical and political, it may be that they do not happen to know that there is a Pasteur Institute in the City of New York, while there is no such institution in the big, wealthy Province called Ontario.

THE PREVENTION OF TUBERCULOSIS.

A very important discussion on tuberculosis took place in the House of Commons December 13th. Mr. George H. Pearley, Vice-President of the Canadian Association for the Prevention of Tuberculosis, proposed the following resolution: "That in view of the encouraging results which have come from the money already spent in disseminating information regarding tuberculosis, and of the interest which the people of Canada are taking in this question, and also in view of the great saving in life which has been brought about in other countries by practical work in this connection, this House is of the opinion that Parliament should now take more active steps to further lessen the great suffering and mortality caused by this disease."

In speaking of the resolution Mr. Pearley said that, apart from human considerations, there is an immense money loss due to tuberculosis. The cost in the United States of every consumptive who dies is \$8,000. As at least one in 38,000 people die of tuberculosis in every year the total money loss is almost beyond

comprehension. In Canada from 8,000 to 10,000 die annually; of this number half could be saved. Figuring each life as only worth \$1,000, and the loss through incapacity and suffering be another thousand dollars, we find a yearly loss of from sixteen to twenty million dollars.

The fight against the disease has really only commenced, and the public scarcely realize yet the seriousness of the situation. Tuberculosis is not as a rule inherited, and the disease is curable if taken in time. He thought the present grant of \$5,000 a year to the Canadian Association should be increased. Information should be disseminated, and lectures delivered by experts for the purpose of interesting the people in every locality and inducing them to form local associations.

Railway cars and steamers should be kept free from infection. Drs. Beland, Black, Roach, Schaffer and others supported the resolution. The Honorable Mr. Fisher, on behalf of the Government, accepted the resolution, and said the Government would ask for a larger grant to the Association. He would not, however, enter into the field of building sanatoriums. He added that the Provinces of British Columbia, Manitoba and Nova Scotia were doing good work in that direction.

FRESH AIR AND HEALTH.

The public generally understand that fresh air is very important from a health standpoint. We get sermons and lectures on the subject from various quarters. Notwithstanding all our knowledge, however, it is probable that there is no country in the world where houses and offices are so thoroughly impregnated with foul air, from early Fall to late Spring, as in Canada.

We clap on double windows, and keep our houses as nearly hermetically sealed as possible.

Our dear good mothers take extra precaution in protecting their young babies and children from drafts. The little ones

are frequently brought into the most ill-ventilated room in the house for their baths. To make conditions in the room worse, one of those terrible abominations, the gas stove, is often set going, and consumes nearly all the oxygen there happens to be in the atmosphere of the room. After getting their baths, the unfortunate little ones are left in these cosy rooms for two or three hours to breathe chiefly carbon-dioxide.

A very sensible letter, signed by C. N. Merritt, appeared recently in the *Toronto Mail and Empire*. The writer referred especially to tuberculosis, which was frequently caused by long exposure to impure air, the chief feature being the lack of oxygen in the air. The writer says: "I have often gone into public offices in Toronto where the air was so charged with carbonic acid gas that I could not remain there ten minutes. I do not pretend to give any scientific reasons for these things. There are numbers of public buildings and offices that are never properly ventilated from the time the furnaces are lighted till the hot weather comes. I am sure the same may be said of most of the schools."

There is nothing new about this, of course. The men downtown in these badly ventilated offices know more or less about the evils of contaminated air. They have certainly been told often enough about the matter. Notwithstanding all their knowledge, however, they shiver when a breath of fresh air enters the office, and proceed immediately to shut everything up tight.

BRITISH MEDICAL ASSOCIATION.

The Annual Meeting of the British Medical Association for 1910 will be held in London, Eng., next July. The last meeting in London was held in 1895 under the Presidency of Sir Russell Reynolds.

The *British Medical Journal*, in commenting on the subject, expresses the opinion that the visitors of 1910, who visited the city in 1895, will be struck by the remarkable progress which

has taken place in that city during the interval, in many directions. Many of the London hospitals have been transformed during this time.

The *Journal* thinks that in Mr. Butland, the President-elect of the Association, the members have an ideal chief, whose infectious enthusiasm will permeate the numerous bands of workers which have already been organized to secure the success of the meeting.

In addition to the meeting of 1895, the Association held its annual meeting in London on two occasions. The first was in 1862, when Dr. Geo. Burrows was President. The second was in 1873, when Sir Wm. Ferguson was President. It is expected that invitations will be given to the Association to hold the annual meeting in Birmingham in 1911, and in Liverpool in 1912.

THE DANGERS OF FOOTBALL.

We have lately received considerable information respecting the dangers of football from prominent athletes and trainers of athletes in the universities of the United States. We are told that the question of condition is a very important one in estimating the dangers connected with the game.

We are told that, in football, if a man is in perfect physical condition, he rarely gets seriously hurt. He may be bruised, or "laid out" for a short time, but nine times out of ten he will feel ready for another game the next day. It has been noted that three-quarters of the bad football accidents occur early in the season, the assumed reasons being that the players have not toughened up. We find this statement in an article which recently appeared in the *Toronto Mail and Empire*. The article goes on to state that most of the remaining accidents happen in the last game or two; that the players have been weakened by the hard season's play, and are stale from too much practice.

We are also told, on the other hand, that over-training involves about as many dangers as under-training. An example of over-training is found in two places, West Point and

Annapolis. The soldiers of these two places are practically in training all the year round. The extra training that they go through before playing their matches makes them stale, and the result is that more men are injured on the West Point team than on all of the university teams. Murphy, the trainer of the Yale team, tells us that he is unable to recall a single fatal accident that ever occurred at Yale, Princeton, Harvard, Pennsylvania or Cornell. We think, perhaps, our friend, Harry Griffiths, the worthy coach of the Toronto University football team, could give the world some pointers on this subject.

NOTES.

A fine of \$50 was imposed upon a dairymen of Winnipeg convicted of watering milk December 14th. He had been convicted before on a similar charge.

Magistrate Denison registered a conviction against Andrew B. Henderson, of Toronto, an osteopath, for a breach of the Medical Act, December 13th. His Worship imposed a fine of \$40 and costs. The counsel for Henderson stated that he would enter an appeal.

As a result of certain experiments of "cold air" rooms in a couple of the public schools in Chicago, it was decided about December 14th to have lower temperature for the schools, airing of class rooms several times a day, and a general campaign for health conditions for the children in attendance.

"Shaky Hands."

We are asked should a surgeon personally drive an automobile just before performing a delicate operation. We do not happen to know any reason why he should not, but we know that motor driving is what might be termed hard work, and a surgeon or any other person may overdo it, and as a consequence might have shaky or weakened hands. We are told by certain observers in some of the operating rooms in Toronto that in many instances the assistants now have to thread all the needles used.

New Central Prison.

We are pleased to note that the Government has finally decided to move the Central Prison from its present site in Toronto. Three farms have been bought near Guelph, after a very careful examination of many other properties in different parts of the Province. There seems to be a general consensus of opinion that the property selected will be very suitable in all respects.

The Ontario Asylum Service has opened an Out-Patient Department, under the title of the Ontario Clinic for Nervous and Mental Diseases. The patients will be seen on Wednesday and Saturday mornings in the Building in Chestnut Street occupied by the Gynaecological Service of the General Hospital. The members of the staff in attendance will be glad to look after any patients that may be referred to them by general practitioners. The aim of the undertaking is to supply advice and help to the patients through the application of various psycho-therapeutic measures of treatment, besides early cases of the psychoses, and such as dementia praecox, depressing insanity, etc. Patients suffering from such mental maladies as obsessions, hysteria, fobius, and anxiety neurosis will also be accepted for treatment. No persons suffering from organic disease of the nervous system will be treated. The treatment given in the clinic will be under the direction of Drs. C. K. Clarke and Ernest Jones.

Personals.

Dr. J. Orlando Orr, of Toronto, returned from Great Britain December 13th.

Dr. Charles B. Shuttleworth has removed from 45 Bloor Street East to 478 Huron Street.

Dr. Jas. Francis Williams, of Bracebridge, sailed from New York for the Mediterranean December 4th.

Obituary.

HERBERT CHARLES WILSON, M.D.

Dr. H. C. Wilson, of Edmonton, Alta., died at his home, Friday, Dec. 17, aged 51. In his younger days he lived in Prince Edward County, Ontario, and received his education at Trinity Medical College, Toronto. He graduated from that College in 1882, and shortly afterwards went to the North-West Territories, where he practised up to a short time before his death.

Book Reviews.

THE PRACTITIONERS' VISITING LIST FOR 1910. An invaluable pocket-sized book containing memoranda and data important for every physician, and ruled blanks for recording every detail of practice. The Weekly, Monthly and 30-Patient Perpetual contain 32 pages of data and 160 pages of classified blanks. The 60-Patient Perpetual consists of 256 pages of blanks alone. Each in one wallet-shaped book, bound in flexible leather, with flap and pocket, pencil with rubber, and calendar for two years. Price, by mail, postpaid, to any address, \$1.25. Thumb-letter index, 25 cents extra. Descriptive circular, showing the several styles, sent on request. Lea & Febiger, Publishers. Philadelphia and New York. The best visiting list for this year.

AN EPITOME OF DISEASES OF WOMEN. By Charles Gardner Child, Jr., M.D., (Yale), Clinical Professor of Gynecology, New York Polyclinic Medical School and Hospital. 12mo, 210 pages, with 101 engravings. Cloth, \$1.00, net. Lea & Febiger, Publishers, Philadelphia and New York. 1909. (Lea's Series of Medical Epitomes. Edited by Victor C. Pedersen, M.D., New York.)

As an epitome, the little volume before us is very complete and up-to-date. It certainly goes over the whole subject, and is brief, necessarily. It, like all of the Epitomes, serves a useful purpose of quick and ready reference, aiding one at the moment, or sharpening up a memory, but for complete understanding, the larger works must be referred to.

A TEXT-BOOK OF SURGERY. By George Emerson Brewer, A.M., M.D., Professor of Clinical Surgery, Columbia University, New York. Surgeon to the Roosevelt Hospital, etc. With 415 engravings and 14 plates in colors and monograms. Skin edition, thoroughly revised and much enlarged. Lea & Febiger, New York and Philadelphia. 1909.

This is an admirable text-book and is well suited for both students and practitioners. There are 870 pages of reading

matter in addition to an excellent index. This means that the book is a very convenient one and (to use the words of the author) may be considered to occupy a position midway between the brief manuals and the more voluminous treatises. The book is well published, well illustrated, is very readable, and in all respects up-to-date.

PROGRESSIVE MEDICINE. A quarterly digest of advances, discoveries and improvements in the medical and surgical sciences. Edited by Hobart A. Hare, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College, Philadelphia; assisted by H. R. M. Landis, M.D., Assistant Physician to the Out-Patient Medical Department of the Jefferson Medical College Hospital. December 1, 1909. Lea & Febiger: Philadelphia and New York. \$6.00 per annum.

This volume contains articles on diseases of the digestive tract, by Edsall; of the kidneys, by Rose Bradford; surgery of the extremities and joints, tumors, anesthesia, shock and infections, by Bloodgood; genito-urinary diseases, by Belfield; and a practical therapeutic referendum, by Landis.

All the work in this number is of a very high order, and we consider the volume of exceptional merit. *Progressive Medicine* has come to our desk for such a long time that it has become absolutely indispensable. Should we wish the references to some work done within the last year, we have only to take down the last number of this excellent quarterly and look up the proper article to get all the information needed. Everything is epitomized in the best possible way, opposing views are stated fairly, and altogether the journal is the most satisfactory in the English language.

Miscellaneous.

Dr. Gaudichard, in a recent number of the *Répertoire de pharmacie*, comments on the knowledge of the ancients as regards opotherapy and its various ways of utilization. Thus in the early centuries we find that the products derived from the animal kingdom were in the shape of powders. This primitive notion was necessitated on account of the rudimentary states of all tools at this epoch. Preference was controlled by circumstances. In the fifth century, Sextus Placitus Papyriensis advocated the use of the animal vulva, desiccated and pulverized. In the sixteenth century various parts of animals were first roasted, then burnt, after which pulverization was easily effected. At this period thought was also given to the conservation of organic products by sprinkling them with yellow sandalwood, or surrounding them with wormwood. The animal powders were even combined with other remedies. Baudon, in his pharmacopeia, writes as follows: "The electuary of lungs is prepared by mixing sugar with equal parts of the lung of the fox, liquorice juice, maidenhair, fennel- and anise-seeds." And in the seventeenth century, Van Helmont placed desiccated blood above all other preparations. Organic extracts, though not called by this name, were utilized in ancient times. In the beginning of the Christian era (about 65 A.D.) Dioscorides, of Anazarba, a Greek physician, who had gained renown by a treatise on materia medica, wrote to this effect: "The liver of the hedgehog, dried in the sun in a pot exposed to the full rays of sunshine, taken with honey, benefits and cures diseases of the kidneys and dropsy." A bouillon prepared after a fox's lung had been desiccated was considered an excellent draught in all cases of difficult breathing. Pliny prescribed hogs' testicles, macerated in milk, in epilepsy. In the centuries which followed, macerated testicles did not lack in popularity. Joseph du Chesne's favorite prescription as an aid to conception was rams' testicles soaked in wine and then dried. Afterwards they were pounded, macerated and boiled over a slow fire in two litres of malmsey, a wine of Napoli di Malvasia. Here is surely an extract that can well hold its own among all extracts!

Syrups containing extracts from animal organs were not ignored by the ancients. The archives devoted to opotherapy abound with enough instances to show that these preparations were held in high esteem in the earliest centuries. Dioscorides, in his "*Materia Medica*," recommends for a cough the daily use of

an electuary composed of the lung and palate of the deer, dried on a dung-hill and then thoroughly beaten up with honey. Pliny is of opinion that the best remedy for hemoptysis is a pâté of snails, a preparation not unknown to our modern pharmacopeia. Incontinence of urine was combated by the administering of macerated bladders mixed with salt or honey, so that absorption might the more readily be effected. In splenic affections, John of Cuba prescribed beef spleen mixed with honey. And finally, Dusseau hit upon what he thought was a great discovery when he evolved his powerful aphrodisiac, consisting of birds' brains, to which were added the yolks of eggs and honey!—*Interstate M. J.*

Constantly Favorable Results.

Dr. John Arthur Diggle, Med. Ref. Globe Accident Assur. Soc. of London, Eng., in writing of antikamnia tablets, says: "I may state at the outset that they satisfied me well, and the constantly recurring favorable reports prove that most who have given them a fair and thorough trial are quite satisfied with the results which have followed. They seem to be absolutely safe in exhibition and to have no effect whatever on the healthy human organism. Such a safe analgesic and antipyretic is a perfect god-send in these days of 'nerves' and all the resultant neuralgias developed under our civilization. In the cases in which I have used antikamnia tablets I have never noticed any ill effects. As an analgesic, in my experience, the sooner the remedy is administered after the onset of pain, the quicker the relief, and the smaller the amount of the drug required; this would follow almost of course, but I think the oftener the dose is repeated in judiciously small doses, the better the result, as compared with larger doses less frequently given. Given in such doses, and at such intervals, I have found antikamnia tablets most useful in neuralgic cases and acute rheumatic attacks, and in sudden nervous attacks with severe pain. In case of paraplegia, in which the suffering from pain in the paralyzed limbs was agonizing, and had only yielded before to gradually increasing doses of morphine hypodermically, their effect was, and continued to be, good. In a case of typhlitis both the analgesic and antipyretic properties were signally shown. In some cases of dysmenorrhoea one or two tablets relieved the pain, and the after use of caulocorea for a while prevented its return. The rapidity with which they acted in some cases of migraine seemed simply marvelous."