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Commencement

The Class of 1967

The largest class in the history of the Medical School – 156 strong – graduated from the University of Minnesota in ceremonies held June 9-10, 1967. Its 141 men and 15 women members were among approximately 3,500 graduates receiving University degrees at Spring Quarter Commencement.

The previous largest medical class was 148 in 1965, but plans are being drawn for classes of up to 250 students in the future.

Recognition Day Exercises began June 9 with an afternoon academic procession into the Mayo Auditorium. The procession was led by faculty marshals N L Gault Jr. and Gertrude Gilman and 11 student marshals, and the Mayo Auditorium was filled to capacity with graduates, families and guests.

Dean Robert B. Howard gave the official welcome, and Associate Dean H. Mead Cavert presented the Class of 1967. Class president David S. Cannom delivered the traditional Class Response, and Dr. Lawrence B. Boies, retiring professor and head of E.N.T., administered the Declaration of Geneva to the graduating class.

Paul Batalden listened intently . . .

Dr. Charles G. Sheppard, president of the Minnesota State Medical association, conferred the 1967 *Distinguished Teaching Awards* of the Minnesota Medical Foundation on James F. Koerner, associate professor biochemistry, and James H. Moller, assistant professor of pediatrics. They were winners of a medical student poll recognizing outstanding achievement in medical teaching. Koerner and Moller were the 9th and 10th recipients of the honor, which carries a $1,000.00 honorarium provided by the Minnesota State Medical Association. The principal address was a University of Minnesota *Regents' Lecture* by Dr. Owen

H. Wangensteen, retiring professor and chairman of the Department of Surgery. His topic was *"What of Tomorrow?"*

Student honors went to Madelyn E. Olson and Sarah A. Nunneley, *American Medical Women's Association Citation* for scholastic achievement; Stephen N. Haas, *Southern Minnesota Medical Association Award* for proficiency in medicine and surgery; Dale N. Gerding and John F. Zurek (juniors), *Mediclinics Scholarships* for exemplary records of scholastic and professional achievement.

. . . as Dr. Wangensteen spoke

Members of *Alpha Omega Alpha,* honor medical society; *James E. Moore Society; Cyrus P. Barnum, Jr., Society;* Medical Student Council; and Medical Student Adytum Cabinet were recognized.

Following the recognition program the Dean's Reception was held at the Campus Club, concluding with the now traditional Senior Class Farewell Banquet. Melvin Schwartz was M.C. and Dr. Richard V. Ebert, new head of the Department of Medicine, addressed the audience.

Continuing an idea established a year earlier, the Seniors created a *Class of 1967 Fund.* David S. Cannom, class president, headed a fund committee of 17 seniors. About 85% of the 156 graduating seniors pledged their participation. They promised a minimum $15.00 per year gift to the Class of 1967 Fund over 25 years. The Minnesota Medical Foundation will serve as trustee of the fund, which will ultimately become a Class Gift to the Medical School. John R. Schotzko was elected chairman of the *Class of 1967 Fund* for a five year term. J. Michael Ryan was named assistant chairman. Members of the Class Fund board are Richard Biery, David Cannom, Paul Casperson, R. Chris Diercks, George Eugster, Beverly Friedell, Joe Greenberg, Gerald Jurgens, William Norberg, Clyde Olson, Ross Olson, J. Michael Ryan, Brian Saine, John Schotzko, Vern Strand, Ordean Torstenson, and Don Wennberg.

Dr. C. G. Sheppard gave Distinguished Teaching Honors to James Koerner and James Moller of the Faculty

The Class of 1967 leaned toward Minnesota in its choice of internships. Fifty-two graduates (33%) chose Twin Cities or Duluth hospitals. Thirty-two (20%) are headed for California.

Rotating internships, giving experience in several major specialties and preferred by most interested in general practice, were chosen by 76% of the class. Ten members of the class will intern at University of Minnesota Hospitals with straight internships.

Dr. H. M. Cavert, associate dean, said 97 graduates of other medical schools will intern in Minnesota during 1967-68, approximately equalling the number of University of Minnesota graduates who are interning outside Minnesota.

Thirty-four members of the Class of 1967 (22%) were assisted by scholarship aid from the Minnesota Medical Foundation during Medical School, and many more used the Foundation's interest-free loan program.

The long grind WAS worth it

Response of the Class of 1967

David S. Cannom
Class President

Dean Howard, Dr. Wangensteen, and honored guests:

At the outset it is a pleasure to acknowledge the contributions made to the graduating class by this group present here today. To the faculty, we acknowledge our intellectual debt. To our parents, we acknowledge their personal investment through the years of our upbringing and beyond, and we appreciate ending up compulsive enough to get through Medical School. To our wives, we acknowledge the support, both personal and, in some cases financial, which has kept us well-fed and happy. Of course, we expect the financial support to continue through the years of internship and residency ahead.

I hardly think that we are the same intensely uncomfortable group that sat in this auditorium four years ago as freshmen and had the demands and deities of the Medical School gravely introduced to us by Dean Howard. In the four years that have passed, a vast metamorphosis has occurred with a profound effect on our way of life and world view. Today, at this important moment, I would pause and consider both what we have accomplished and what remains undone.

First and pre-eminently, in our four years of Medical School we have been collectors and sifters of facts. We have jousted with fat textbooks and thin outlines, and have cajoled our wits to retain the various differential diagnoses, eponyms, syndromes, and treatment schedules that are the very essence of clinical medicine. Under the shadow of un-ending examinations we have studied longer, and in turn forgotten more, than at any other period in our lives. And the distressingly small amount of useful information that we carry around in our heads is a constant reminder that in a quantitative way, we will never know enough.

Secondly, in our four years of Medical School our personal and philosophic horizons have widened. The boundaries of our world have been extended to include intracellular particles so small they can be seen only with the electron microscope, and to enzyme systems so vast they run through all of nature. At another level, we are not able to de-personalize completely the

suffering of our patients, and we are forced to contend with the inexplicable impartiality of the moral universe just as objectively as we are faced with the mysteries of the physical universe. Death has become an everyday event, and we coin euphemisms to denote the word, secretly aware of our frequent inability to avert it. Yet these philosophic changes are so wrapped up in our defense systems that they go largely unrecognized.

Thirdly, these four years of Medical School have bonded the 156 of us. We have worked together, relaxed together, done ENT examinations on each other, and, in one instance, even married each other. We have formed many casual friendships and a few very deep ones. Out of our conviction that every department in the school is out to make life unnecessarily difficult for us has grown a certain comaraderie which spawned the humor and the rebellions, and has redeemed many otherwise tiresome assignments.

David S. Cannom

And now all that is behind us. Yet today, at this crossroads in our career, we take on a new, yet incomplete, identity. We are applying for admission to a profession which is in a process of re-defining itself, and which is taking on important new forms both in education and patient care. Yet through these changes certain imperatives remain. For the future researcher among us it means applying himself to matters of genuine scientific concern and not bagatelles which are neither current nor important. For the future educator, it means dedicating himself to undergraduate education and not using the privilege of an academic appointment for unrelated gains. For all of us it means re-discovering the patient and achieving patterns of practice that will best suit his constellation of needs, both medical and non-medical.

That goals such as these often go unfulfilled is understandable. Four years has shown us the compromises of intent, induced by over-busy schedules, fatigue, and self-interest. But

medicine in its purest form, when it is least a trade and most a profession, challenges us to add to our already acquired body of facts a quality of concern and honesty which transcends science. As Oliver Wendell Holmes wrote in *"The Professor at the Breakfast-Table"*:

> *"You may be sure that some men, even among those who have chosen the task of pruning their fellow-creatures, grow more and more thoughtful and truly compassionate in the midst of their cruel experience. They become less nervous, but more sympathetic. They have a truer sensibility for others' pain, the more they study pain and disease in the light of science."*

This personal quality of doctoring, which goes beyond our talent as scientists, enables us to fulfill the promise of our profession and to become complete physicians.

Dean E. Abrahamson

Robert W. Adams

Charles P. Allison

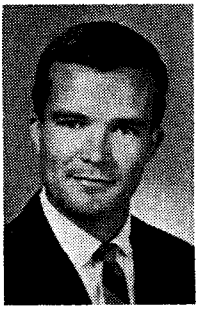
Duane G. Amundsen

Barbara J. Andersen

Joseph C. Arko

Paul B. Batalden

James M. Beckley



Ronald A. Beggs

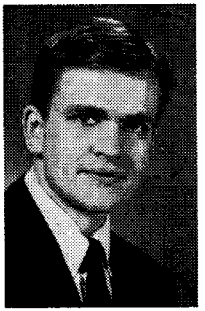
John W. Benton

Judith F. Bergfalk

J. E. Bergstedt, Jr.

James N. Bertelson

Richard M. Biery



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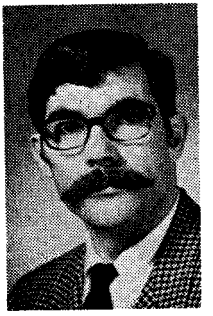
Mark R. Eckman

Richard F. Erpelding

L. Michael Espeland

George S. Eugster

Charles M. Evans



Richard Evans, Jr.

Harold J. Fletcher

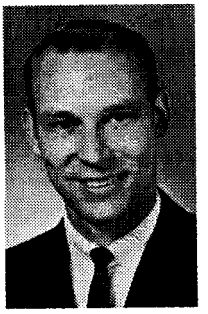
James A. Flueck

D. L. Frederickson

Beverly R. Friedell

Thomas F. Gilles

Boyd W. Goetzman



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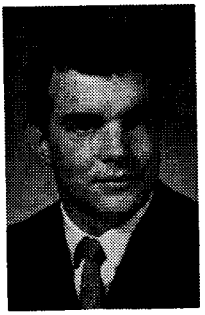
Joseph J. Gutenkauf



Stephen N. Haas

Charles A. Haislet

David K. Haldorsen

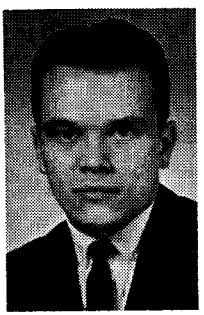
Dea Halverson

David F. Harder

Gene R. Hartmann

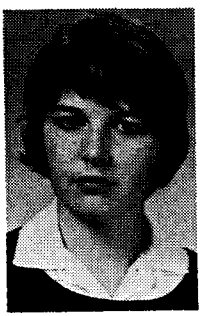
Barbara Hastings

A. A. Heckman, Jr.



James A. Hengel, Jr.

Richard N. Hill



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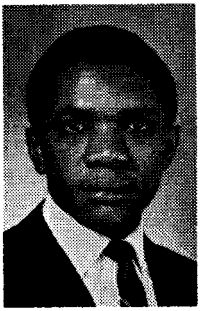

Peter A. Kitundu

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Intern: Orange County General Hosp.
Orange, Calif.

Nelson, André J.*†
St. Paul
Augsburg College
Intern: Parkland Memorial Hosp.
Dallas, Tex.

Nelson, Richard Arthur
St. Peter
University of Minnesota
Intern: Presbyterian Medical Center
Denver, Colo.

Neubert, James W.
Mankato
University of Minnesota
Intern: Sacramento County Hosp.
Sacramento, Calif.

Newman, Robert P.
Minneapolis
Dartmouth College
Intern: Henry Ford Hosp.
Detroit, Mich.

Nielsen, Clifford D.
Duluth
University of Minnesota, Duluth
Intern: St. Mary's Hosp.
Minneapolis

Nielson, David Greer†
Evanston, Ill.
University of Minnesota
Intern: U.S. Naval Hosp.
Oakland, Calif.

Norberg, William J., Jr.
Barnum
University of Minnesota
Intern: Univ. of Ky. Medical Center
Lexington, Ky.

Nordberg, Robert J.
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University of Minnesota
Intern: St. Luke's Hosp.
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Nunneley, Sarah A.†
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Mt. Holyoke College
Intern: Kings County Hosp. Center
Brooklyn, N.Y.

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Michael J. Ogg

Clyde R. Olson

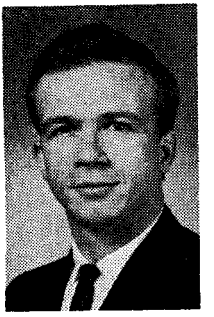
Leroy D. Olson

Madelyn E. Olson

Ross Stanley Olson

Charles W. Patterson

K-Lynn Paul



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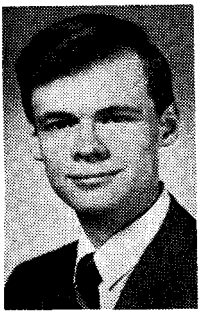
Glenn L. Pohlman

John Howard Pratt



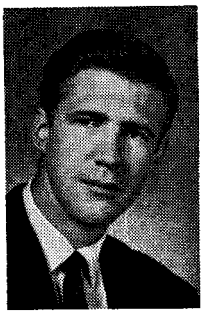
Richard A. Pratt, II

Steven E. Prawer

Robert R. Prentice

James D. Priest

William W. Rodman



F. Paul Roschen

Ogg, Michael J.
Heron Lake
University of Minnesota
Intern: Wayne County General Hosp.
Eloise, Mich.

Olson, Clyde R.
Glenwood
Moorhead State College
Intern: St. Mary's Hosp.
Duluth

Olson, Leroy D.*
St. Paul
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Olson, Madelyn E.*†
Minneapolis
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Intern: Cornell Univ. Hosp.
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Olson, Ross Stanley
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Intern: U.S. Naval Hosp.
Pensacola, Fla.

Patterson, Charles W.*
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South Dakota State College
Intern: Orange County General Hosp.
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Paul, K-Lynn
Fergus Falls
Brigham Young University
Intern: Marion County General Hosp.
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Lafayette, Ind.
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Intern: Tripler General Hosp. (U.S. Army)
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Pohlman, Glenn L.
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Intern: Hennepin County General Hosp.
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Pratt, John Howard
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Prawer, Steven E.
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Prentice, Robert R.
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Minneapolis
Carleton College
Intern: Hennepin County General Hosp.
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Rodman, William W.
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Marlin K. Rosin

Carroll D. Rund

J. Michael Ryan

Brian D. Saine

Mark L. Satz

Robert L. Scheibel

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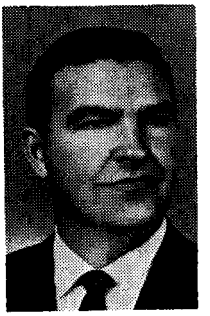

John R. Schotzko

Melvin M. Schwartz

Robert J. Selmo

John S. Shronts

Allan D. Singer

Michael T. Spilane

Alfred O. Steldt

Michael D. Stenberg

Vernon F. Strand

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Joseph W. Tempel

John S. Tendall

O. L. Torstenson

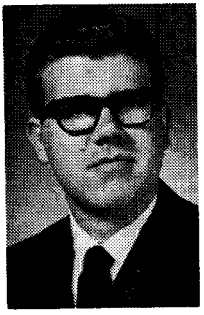
Victor H. Tschida

Josph M. Vigneri

Roger J. Vitko

Don W. Wennberg

Robert W. Westafer



Stuart P. Westburg

Michael Yablonski

Bruce Zimmerman

D. E. Zimmerman

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Intern: St. Paul-Ramsey Hosp.
St. Paul

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St. Paul

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Westafer, Robert W.
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Sacramento, Calif .

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Otolaryngology

Pathology and Treatment of Chronic Otitis Media*

Michael D. Paparella, M.D.†

The most important pathology of chronic otitis media is cholesteatoma and granulation tissue occurring either concomitantly or separately in the middle ear and mastoid. Both pathological types may have a similar etio-pathogenesis and may be potentially serious. Since medical treatment is supportive and not curative the proper treatment consists of extensive and meticulous eradication of all accessible pathological tissues in the mastoid air cell system and middle ear in combination with reconstructive or tympanoplastic techniques to maintain or restore hearing when possible.

Cholesteatoma is usually acquired and can be defined as an onion-like layered mass of debris and keratinizing squamous epithelium which sometimes appears cystic. There may or may not be deposition of cholesterin and thus "cholesteatoma" may be a misnomer. Its process of formation usually begins in the attic of the middle ear and conductive deafness results from the destruction of ossicles through adjacent pressure necrosis and osteolytic action. Depending upon the direction and extent of bony destruction and the type of co-existent infection, the following complications may occur; meningitis, epidural abscess, brain abscess, sigmoid sinus thromboses, labyrinthitis and facial paralysis. Although the role of cholesteatoma in chronic suppurative otitis media nd mastoiditis is generally well recognized, other types of pathology are not. Depending on anatomical variations, destruction of bone can also be associated with areas of entrapped granulation tissue within the mastoid. It is also possible for some of the complications mentioned above to occur in the absence of cholesteatoma and in the presence of granulation tissue in the mastoid. It should be mentioned, however, that cholesteatoma is more frequently associated with complications. Granulations may be soft or butterfat-like in consistency or hard and fibrous. Often cholesteral clefts are present and the term "cholesterol granuloma" may be applied.

*From a report to the Staff Meeting of University Hospitals on June 2, 1967

†Professor, Department of Otolaryngology; Head of Department, 7-1-67

Histopathological observations of temporal bone specimens from patients who died having had chronic otitis media and mastoiditis demonstrated extensive granulations with resorption and deposition of bone appearing in marked degree in the middle ear and mastoid. Many simple mucosal glands were also seen enmeshed within a markedly hyperplastic mucosal lining. It is likely, but not proven, that local enzymatic action resulting from either the granulation tissue itself or associated putrefaction may stimulate the process of osteolysis. The characteristic symptom of chronic suppurative otitis media is a painless constant or recurrent discharge from the ear which may be foul smelling and purulent or mucoid in nature. Cultures are sometimes helpful but usually reveal a mixture of organisms. Systemic antibiotics are usually not helpful except in the presence of acute exacerbation of infection. Pain, vertigo and other neurological signs are ominous and suggest impending or existent complications. Medical management of chronic otitis media and mastoiditis is primarily local and includes careful cleansing under microscopic magnification and the application of topical antibiotic powders and drops. It is also important to eradicate contributing factors.

Complications of acute and chronic mastoiditis were common in the pre-antibiotic era. It has been assumed by some that such complications occur rarely or not at all today. Because of penicillin administration and properly applied drainage procedures acute mastoiditis with or without complications occurs rarely. Complications of chronic mastoiditis still occur all too frequently.

The pathological processes of chronic otitis media and mastoiditis usually date back to childhood and result in disease which is trapped within the mastoid whereupon a refractory state develps. The roentgenograms in such cases usually show a markedly hypocellular or sclerotic mastoid as a result of Eustachian tubal dysfunction since childhood. The mucoperiosteum lining the middle ear and mastoid is destroyed and replaced by granulations or cholesteatoma. The tympanic membrane is also partially destroyed and a perforation is seen.

The classic operative procedures are radical mastoidectomy and modified radical mastoidectomy. The radical mastoidectomy consists essentially of an eradication of the mastoid air cell system, the contents of the middle ear, the tympanic membrane and posterior bony canal. This procedure results in a 50-decibel loss of hearing in most cases since there is no attempt at hearing restoration.

A preferable technique includes the principles of careful and adequate mastoid surgery but combines them with tympano-

plastic techniques utilizing the binocular operating microscope. The various components of this operation are all done at the same time, and consist of (1) the exenteration of all available air cells in the mastoid to insure removal of mastoid disease; (2) utilization of microscopic tympanoplasty techniques in the middle ear to remove pathological tissues, to graft the drumhead defect and to reconstruct the sound conducting mechanism; and (3) obliteration of the mastoid cavity using a postauricular muscle pedicle which reduces the mastoid bowl to a canal or near normal size. Obliteration of the mastoid cavity helps to preclude the postoperative difficulties which often occur with large cavities.

The exact type of tympanoplasty procedure which is used must be modified according to the extent and location of pathology found at the time of surgery. In chronic suppurative mastoiditis and otitis media usually a Type III or Type IV tympanoplasty will be indicated. Use of microsurgical techniques to treat this condition will in most instances provide conversion of a wet draining ear, which may be potentially serious, into a dry one. In addition, the adaptation of microsurgical techniques to restore middle ear function will in many instances provide an improvement of hearing to a serviceable level. This, of course, is particularly important in patients having bilateral ear infection. The achievement of a good hearing result will depend to a large extent on the patient's postoperative eustachian tubal function.

Biochemistry

Sugar Nucleotides and Cell Wall Lipopolysaccharides of Bacteria*

Ronald D. Edstrom, Ph.D.†

One of the major components of the cell walls of Gram-negative bacteria is a complex lipipolysaccharide. This macromolecular substance, which may be isolated from the cell surface by one of several methods, has also been known as the

*From a report to the Staff Meeting of University Hospitals on June 9, 1967

†Assistant Professor, Department of Biochemistry

somatic 0 antigen or endotoxin because of its potent toxic effect when injected into animals.

Many of the structural aspects of the cell wall lipopolysaccharides are not yet fully understood. It is possible, however, at least with regard to some species of Salmonella and Escherichia, to draw some general conclusions relative to the overall structure and in some cases to give very specific structures for portions of the molecule.

The lipopolysaccharide from *Escherichia coli* O111-B_4 has a general structure which may be described as follows: There is a lipid portion which does not contain triglycerides or other "typical" lipids but rather has 0- and N- fatty acyl groups on the amino sugar D-glucosamine; one of the predominant fatty acids is β-hydroxymyristic acid. The lipid portion also contains phosphate groups esterified in undetermined positions. To this lipid portion of the polymer is attached a polysaccharide backbone. The linkage between the lipid and polysaccharide is provided by an unusual eight carbon sugar acid, 3-deoxyoctulosonate. The "backbone" itself is composed of a heptose (a seven carbon sugar), O-phosphorylethanolamine and some additional esterified phosphate. To this "backbone" are attached the O-antigenic polysaccharide side chains, which these studies indicate, consist of a repeating, branched pentasaccharide containing the following sugars: galactose, glucose, N-acetylglucosamine and two colitose residues (3, 6-dideoxy-L-galactose). The exact structure of the pentasaccharide in which the position and anomeric nature of the glycosidic bonds are defined was determined by a series of chemical and enzymatic degradations. A derivative of the pentasaccharide in which the reducing terminal galactose had been converted to threitol was found to have a significant activity in blocking the reaction between the intact lipopolysaccharide and an antiserum prepared against it.

The biosynthesis of the O-antigenic polymers was studied by use of a mutant of the organism. The mutant lacked one of the enzymes involved in galactose metabolism, uridine diphosphate galactose-4-epimerase. This enzyme is one of those necessary for the formation of galactose from other nutrients. When galactose was not provided to the mutant organism in the growth medium, essentially normal growth occurred except that galactose could not be incorporated into the lipoplysaccharide and an incomplete polymer was produced. Not only was galactose absent, but the other components (glucose, N-acetylglucosamine and colitose) of the antigenic side chain were present in markedly reduced amounts. The absence of the galactose was found to prevent elongation of the side chains. It was possible to in-

crease the levels of these deficient sugars *in vitro*. A particulate fraction of a cell free extract of the mutant organism had the capacity to transfer those sugars which were absent, or present in reduced amounts, to the lipopolysaccharide. This fraction contained both the enzymatic activity responsible for sugar transfer and the deficient lipopolysaccharide acceptor. The sugars were provided to the incorporation system in their activated forms as sugar nucleotides. First, galactose was transferred to the lipopolysaccharide from uridine diphosphate galactose (UDP-galactose). Only after the addition of galactose to the polymer was it possible to demonstrate the transfer of glucose from UDP-glucose. Isolation of a disaccharide proved that this glucose had been transferred to the previously incorporated galactose. Once both galactose and glucose had been added the third sugar in the sequence, N-acetylglucosamine, could be shown to be transferred from UDP-N-acetylglucosamine. The final sugar in the sequential incorporation was colitose. Colitose occurs as its activated derivative in the form of guanosine diphosphate colitose. For significant colitose incorporation, it was necessary to have the three previous sugar nucleotides present in the reaction mixture.

The results of the sequential biosynthetic studies are in essential agreement with the structure proposed for the O-antigenic side chains of the lipopolysaccharide of the wild type organism E. coli 0111-B_4.

The sequential nature of the incorporation of these four sugars into the side chains, precludes their assembly as a lipid bound, activated oligosaccharide intermediate. This finding clearly distinguishes the *E. coli* system from that found in *Salmonella typhimurium* where an oligosaccharide intermediate is involved in the biosynthesis of the O-antigenic side chains.

Physiology

Prevention and Treatment of Ventricular Fibrillation and Arrhythmias with Bretylium Tosylate*

Marvin B. Bacaner, M.D.†

Ventricular fibrillation is a catastrophic event associated with a number of clinical situations that affect the heart, especially as a complication of acute myocardial infarction. Half of the cases of sudden death following acute coronary occlusion have been attributed to ventricular fibrillation. Moreover, many irritable ventricular arrhythmias such as ventricular tachycardia, and multifocal ventricular extrasystoles ultimately terminate in ventricular fibrillation. The prevention and treatment of ventricular arrhythmias particular ventricular tachycardia and fibrillation is clearly one of the most urgent unsolved problems facing clinical medicine.

Bretylium tosylate has been found to powerfully suppress the vulnerability of the dog heart to undergo and sustain ventricular fibrillation induced electrically *(Am. J. Cardiol. 17: 528, 1966)*. In further experimental studies the antifibrillatory potency of bretylium has been evaluated quantitatively and compared to other antiarrhythmic agents. The only reproducible quantitative method for evaluating antifibrillatory activity is by the method of measuring ventricular fibrillation thresholds.

Ventricular fibrillation thresholds were measured by delivering constant current shocks (10 millisec. duration) to electrodes embedded in the left ventricle. Shocks were triggered by the ECG-R wave while exploring for the vulnerable period which occurs during the final one-third of systole during the reflection of the T-wave (Wiggers). This was done by changing the delay after the R wave in 5 millisec. steps at each current setting. Starting with weak sub-threshold stimuli the current strength was gradually increased until sustained ventricular fibrillation was induced.

*From a report to the Staff Meeting of University of Minnesota Hospitals on June 23, 1967

†Associate Professor, Department of Physiology

Marked antifibrillatory effect of bretylium was evident by an increase in threshold from an average control value of 20.3 $\pm$ 4.9 to 66.7 $\pm$ 21.2 milliamperes ($P \ll .00001$). Before treatment with bretylium, fibrillation persisting for more than 1 second always required electrical defibrillation by countershock. After bretylium treatment, long periods of fibrillation persisting in a number of instances as long as 45 seconds frequently reverted spontaneously to sinus rhythm.

When studied by the same method quinidine, procaine amide, guanethidine, dilantin, xylocaine and various β-blockers (propranalol, MJ 1999) were without significant effect in changing fibrillation threshold. However, when bretylium was then given to the same animal fibrillation threshold was usually significantly increased, except after quinidine and guanethidine which usually blocked the bretylium effect.

In addition to suppressing electrically-induced ventricular fibrillation Dr. Joseph Buckley of our Department of Anesthesiology has studied the effect of bretylium on suppressing ventricular fibrillation induced by hypothermia and superimposed hemorrhagic shock. In those experiments hypothermia to 22° C was induced followed by a rapid 30% blood volume hemorrhage from the femoral artery. Ventricular fibrillation was induced in 50% of the control animals by that provocation whereas bretylium pretreatment prevented fibrillation induced under the same circumstances in all animals. Ordinarily the cold heart cannot be defibrillated without first rewarming and this was also true in those animals. However, when bretylium was given intravenously while maintaining external cardiac massage for 15 to 20 minutes, many of the control animals could be defibrillated while the heart was still at 22° C.

On the basis of our encouraging experimental findings we decided to investigate the clinical efficacy of bretylium in the prevention and treatment of arrhythmias. We have used the drug clinically in 13 consecutive patients with acute arrhythmias secondary to various causes including acute myocardial infarction, postoperatively after open heart surgery, digitalis intoxication and in one case of undiagnosed cardiac myopathy. Bretylium 5 mg./kg without exception converted ventricular tachycardia to sinus rhythm (3) completely suppressed multifocal ventricular extrasystoles (5), suppressed ventricular fibrillation (3), and eliminated the Wenckeback phenomenon (2).

In collaboration with Dr. Aldo Castaneda of our Department of Surgery we have been pretreating patients scheduled for open heart surgery with bretylium prior to surgery in order to investigate the effect of this agent on preventing post operative arrhythmias. Twenty patients have received bretylium in-

cluding 1 triple valve replacement, 4 double valve replacements, 9 aortic valve replacements, 3 mitral valve replacements, 1 adult tetrology of Fallot, 1 adult A-V canal, and 1 adult atrial septal defect. The post operative course of all these patients have been remarkably free of postoperative arrhythmias.

On the basis of Dr. Buckley's experimental findings in hypothermia, neurosurgical patients undergoing vascular surgery of the brain under hypothermia have been pretreated with bretylium to diminish the hazard of hypothermic fibrillation. Eight consecutive patients treated with bretylium have undergone hypothermic surgery without incident.

Urology

Testicular Tumors*

Colin Markland, M.D.*

Though testicular tumors are relatively rare, they are extremely malignant, particularly in susceptible 20-35 year old males. Overall survival, despite therapeutic changes in the last decade, is still only 30-40%. (Table 1).

In the last 20 years 32 patients have been treated at the University of Minnesota Medical Center, using surgery, radiotherapy and, more recently, chemotherapy. The age distribution and types of tumor were similar to other reported series, though the initial presentation was usually after initial orchiectomy by the referring physician. Eleven cases were referred for treatment in the terminal stage. However, even when patients were seen early in the disease, 50% to 90% already had positive lymph node metastases (Table 1 and 2). This high incidence of metastases explains both the deadly nature of this disease and our recent attempts to improve survival by more aggressive radical surgery (Table 2).

A scrotal mass in a young man should always be considered a potential tumor. Early exploration through a high inguinal

*From a report to the Staff Meeting of University Hospitals on June 16, 1967
†Associate Professor, Division of Urology

incision allows gentle clamping of the cord prior to visual inspection of the mass. An occasional exploration showing epididymitis will do little harm, while improving chances for early detection and treatment of tumors, torsion, and scrotal hematomas.

This principle of inguinal exploration for potentially malignant scrotal masses dates to the 1890's, when anatomists and surgeons showed the testicular lymphatics drain along the spermatic cord to the renal pedicle.

However, confusion still exists, for since 1966 we have seen 5 patients where the initial treatment included needle biopsy, limited scrotal exploration, or local biopsy. This approach invites disaster, for a separate tissue space is thus exposed to tumor cells which may seed and grow within days. Though this situation is best avoided by the proper high inguinal exploration, we have handled a problem like this by immediate radical groin *en bloc* dissection of the biopsied area. We have avoided local tumor recurrence in these 5 patients, followed 3 months to 2½ years.

Radiotherapy, ideally suited for radio-sensitive seminoma, has also been used with other types of tumor, particularly after surgical removal of involved retroperitoneal nodes. In cases such as this Dr. G. J. D'Angio and his associates have given cobalt irradiation to the mediastinum and supraclavicular area for combination therapy.

Chemotherapy may involve several types of anti-tumor drugs, with hope of palliation. Dr. B. J. Kennedy at our Masonic Memorial Hospital has developed mithramycin as a specific agent in treating advanced embryonal cell carcinoma.

Radical lymphadenectomy, with removal of all nodes from the diaphragm to the pelvis, offers the best surgical therapy for radio-resistant tumors. A thoraco-abdominal incision gives excellent exposure, particularly for complete extirpation of the nodes on the major vessels, above, and around the renal pedicle.

Positive nodes found on ipselateral exploration, even with grossly normal contralateral lymphatics, have been cause for later exploration of the opposite side in three patients. Two of these have then been found to have previously undetected, unsuspected tumor, within three weeks of the initial lymphadenectomy. Bilateral thoraco-abdominal lymphadenectomy, even though involving extensive surgery, has few complications, other then inevitable interference with ejaculation with the L_1 sympathectomy. This has to be a justifiable price for the chance of cure. At present the patient series here is too small to assess completely the value of surgery. However, there are presently three patients alive and well from 3-18 months following re-

moval of bilateral positive nodes. This offers hope and may confirm Patton's series of 1959, when review of surgery for this disease in the U.S. Army showed improvement of 5 year survivals from 0% to 47% after lymphadenectomy of involved nodes.

Summarizing, the treatment of testicular tumors in young men depends on prompt diagnosis and proper removal of the primary tumor by inguinal orchiectomy.

Subsequent treatment involves the combined effects of radiotherapy, lymphadenectomy, and chemotherapy.

At this Medical Center radical surgical excision of the primary tumor and associated lymph nodes is being used in an attempt to improve survival, particularly with radio-resistant tumors.

Table 1

Testicular Tumors. University of Minnesota 1947-1967

Tumor type	*Number of patients*	*Treatment*	*Positive nodes*	*Survival–1 year*
Seminoma	10	O, R	50%	80%
Terato-carcinoma, Embryonal carcinoma, and others	22	O, L, R, C	90%	36%

O = Orchiectomy, R = Radiotherapy, L = Lymphadenectomy, C = Chemotherapy

Table 2

Testicular Tumors. University of Minnesota 1947-1967

Tumor type	*No. of pts.*	*/age*	*Treatment*	*Positive nodes*	*Survival–1 year*
Seminoma	10	40	O, R	5/10	80%
Embryonal cell			O, L	3/4	75%
carcinoma	12	35	O, C	8/8	25%
Terato-carcinoma	3	26	O, L, R, C	3/3	0%
Teratoma	2	2/31	O, L, C	1/2	50%
Chon's-Carcinoma	2	44	O, C	2/2	0%
Other	3	20/65	O, L, R	2/3	66%

O = Orchiectomy, L = Lymphadenectomy, R = Radiation, C = Chemotherapy

Title and Author Index

VOLUME 38, 1966 - 67 — Nos. 1 - 10, September - June

University of Minnesota Medical Bulletin

Medical School News

The 1967 Minnesota State Legislature, considering the expansion of medical education in the state, appropriated $500,000 to the University of Minnesota for planning of its proposed $53 million expansion program in the health sciences. An additional $650,000 was appropriated for land acquisitions for the first stage of the expansion.

A bill introduced to provide "seed money' for a proposed Medical School in St. Paul died, as did a proposal to grant planning funds to a commission of experts who would review applications for new medical schools in Minnesota.

Senate and House committees, however, were directed to continue their study of the need for, and location of, another medical school in the state.

PERSONNEL CHANGES AT MEDICAL CENTER

Dr. C. Walton Lillehei, professor surgery and pioneer cardiac surgeon at Minnesota, has been appointed professor and chairman of the Surgery Department at Cornell University Medical College in New York City. He will also become surgeon-in-chief of the New York City Hospital, taking both posts on November 1, 1967.

Dr. Lillehei has spent 21 years at the University of Minnesota, training here under Dr. O. H. Wangensteen in surgery after graduation from the Medical School in 1941.

Dr. N. L. Gault, Jr. is now on Okinawa with his family, where he is in charge of a graduate training unit of the Uni-

versity of Hawaii College of Medicine. His wife, Sarah, will also practice on Okinawa in the field of physical medicine and rehabilitation.

Dr. Luigi Taddeini, assistant professor of medicine, is now acting chairman of the Department of Medicine at St. Paul–Ramsey Hospital.

Dr. Richard O. Mulhausen of the Minneapolis V.A. Hospital staff was appointed an assistant dean of the College of Medical Sciences, and began work July 1, 1967 at the Medical Center.

Dr. Carl D. Koutsky resigned from the Department of Psychiatry and Neurology to become Director of the Alaska Psychiatric Institute, Anchorage, Alaska, on August 1, 1967.

Dr. Richard M. Magraw has accepted a position as Assistant Director, Bureau of Health Services, U.S. Public Health Service, Washington, D.C., and is taking a leave of absence from the University of Minnesota starting September 1, 1967.

Mr. John Parker, director of medical art and photography, resigned to take a similar post with the new *Milton S. Hershey Medical Center* of Penn State University, Hershey, Pa.

Dr. Harold O. Peterson, chief of radiology, was re-elected Chief of Staff of University of Minnesota Hospitals for the year beginning July 1, 1967.

Dr. William D. Kelly, professor of surgery, has announced his intention to leave the faculty later this year to enter private surgery practice in Minneapolis.

Dr. Paul Strandjord became associate director of the University Hospitals Clinical Laboratories on July 1, 1967.

Student News

Alan M. Gorden, Blackduck, Minn., and **Eugene W. Ollila,** Zim, Minn., were named recipients of the 1967 Rural Medical Scholarships of the Minnesota State Medical Association. Both men have just completed their freshman medical year. They will receive guaranteed $4,000.00 scholarships spread over the four years of Medical School. In return, they have agreed to practice medicine in a rural Minnesota community for at least five years after graduation.

Medical Foundation News

Scholarship Appreciation Fund

Thirty-seven alumni have pledged or given Scholarship Appreciation gifts to the Minnesota Medical Foundation through June 30, 1967. All are former holders of Foundation scholarships while in Medical School.

Dr. M. Melvin Goldfine (Med. '57) Orkland, Calif, is fund chairman. Objective of the effort is to endow the Foundation's Annual Scholarship Program with the gifts and pledges of those who received its benefits in the past. A minimum goal of $500,000 is sought. Over $250,000 has been obtained toward the endowment from all sources to date, including "scholarship alumni," Dr. Goldfine reported. He urged former scholarship holders to contribute or pledge "an amount equal to what was received personally as a student." Nearly 90%, he noted, of the 64 current medical students on scholarship from the Foundation have pledged future gifts to the Scholarship Appreciation Fund.

GIFT/PLEDGE HONOR ROLL

Yossef Aelony '65
% APO, New York
Dale L. Anderson '59
Gallup, New Mex.
Gerald J. Anderson '58
San Diego, Calif.
Louis W. Banitt '58
Ames, Ia.
Charles I. Benjamin '65
Glenwood, Minn.
Ralph W. Bergstrom, Jr. '64
Maple Plain, Minn.
Robert S. Brown '64
St. Paul, Minn.
Harley C. Carlson '51
Rochester, Minn.
George M. Crow '57
International Falls, Minn.
Leland Fairbanks '57
Oklahoma City, Okla.
Charles N. Gamble '55
San Francisco, Calif.
M. Melvin Goldfine '57
Oakland, Calif.
Roland M. Hammer '58
River Falls, Wis.
Eugene W. Hanson '56
St. Petersburg, Fla.
C. Lee Harris '52
Santa Ana, Calif.
Mary C. Howell '62
Haverhill, Mass.
James R. Jude '53
Miami, Fla.
Nancy R. Lund '62
Minneapolis, Minn.
Donald S. Mattson '54
Wonju, Korea
John G. Mulrooney '65
Mattapan, Mass.
Gerald G. Mindrum '61
Yuma, Ariz.
Norman A. Nelson '50
Eloise, Mich.
Sidney Nerenberg '54
St. Louis Park, Minn.
Norman D. Olson '65
St. Paul, Minn.
Avrin M. Overbach '66
Birmingham, Ala.
LaVonne Painter '58
Philadelphia, Pa.
Frederick L. Ramlall '56
New Amsterdam, Guyana
Jerome Scherek '57
St. Paul, Minn.
Stanley W. Shapiro '57
Minneapolis, Minn.
David E. Siewert '60
Bozeman, Mont.
James A. Silver '58
Belle Glade, Fla.
George Skaff '59
Visalia, Calif.
Barbara Hanson Subak '55
Minneapolis, Minn.
John E. Sutherland '62
Marshall, Minn.
Omar A. Tveten '55
St. Paul, Minn.
Paul W. Vander Kooi '65
Sells, Ariz.
Frank Van de Water '57
Denver, Colo.

Supplement to

MEDICAL ALUMNI DIRECTORY

1966

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL

This page is intended as a supplement to the MEDICAL ALUMNI DIRECTORY published in 1966 and distributed to alumni of the Medical School. Detach this page and affix to your copy of DIRECTORY on page 118.

1967 (M.D.)

Abrahamson, D. E.
Adams, R. W.
Allison, C. P.
Amundsen, D. G.
Andersen, Barbara
Arko, J. C.
Batalden, P. B.
Beckley, J. M.
Beggs, R. A.
Benton, J. W.
Bergfalk, Judy
Bergstedt, J. E., Jr.
Bertelson, J. N.
Biery, R. M.
Bjorgen, J. E.
Bloch, S. F.
Blomberg, D. J.
Boardman, P. J.
Bohrer, J. A.
Brockberg, Daryl
Brockberg, J. A.
Bromen, K. A.
Cannom, D. S.
Casperson, P. C.
Cheng, J. W. B.
Custer, J. R.
Davis, A. T.
DeCourcy, D. M., Jr.
Dettman, Carol
Diercks, R. C.
Donndelinger, T. M.
Doyle, W. M.
Dunham, C. K.
Eckert, Elke
Eckman, M. R.
Erpelding, R. F.
Espeland, L. M.
Eugster, G. S.
Evans, C. M.
Evans, Richard, Jr.
Fletcher, H. J.
Flueck, J. A.
Frederickson, D. L.
Friedell, Beverly
Gilles, T. F.
Goetzman, B. W.
Gortner, D. A.
Gramer, L. J.
Grams, R. R.
Greden, J. F.
Greenberg, J. H.
Gutenkauf, J. J.
Haas, S. N.
Haislet, C. A.
Haldorsen, D. K.
Halverson, Dea
Harder, D. F.
Hartmann, G. R.
Hastings, Barbara
Heckman, A. A., Jr.
Hengel, J. A., Jr.
Herczfield, Bonita
Hill, R. N.
Hodge, R. P.
Hoekstra, R. E.
Hoglund, W. J.
Hosfield, W. B.
Hulsing, D. J.
Hyden, R. D.
Indihar, F. J.
Ironside, K. L.
Jacobson, D. R.
Johnson, B. R.
Johnson, F. E.
Johnson, P. E.
Jurgens, G. L.
Katz, J. M.
Keith, D. V.
Kellum, M. J.
Kitundu, P. A.
Klecatsky, L. J.
Kliks, B. R.
Knutson, D. W.
Knutson, R. P. S.
Larkin, T. P.
Lechtman, A. L.
Leet, T. E.
Lepley, Rosalyn
Levitt, Carolyn
Lynch, D. R.
Mack, Marjorie
Maisel, R. H.
Maley, J. G.
Marker, S. C.
Marshall, J. F.
McQuarrie, G. S.
Mensheha, Oksana
Monson, P. S.
Monson, T. P.
Moore, J. S., Jr.
Mottram, P. E.
Muckala, K. A.
Myrom, R. C.
Nelson, A. J.
Nelson, R. A.
Neubert, J. W.
Newman, R. P.
Nielsen, C. D.
Nielson, D. G.
Norberg, W. J., Jr.
Nordberg, R. J.
Nunneley, Sarah
Ogg, M. J.
Olson, C. R.
Olson, L. D.
Olson, Madelyn
Olson, R. S.
Patterson, C. W.
Paul, K-Lynn
Pfendler, D. F.
Pohlman, G. L.
Pratt, J. H.
Pratt, R. A., II
Prawer, S. E.
Prentice, R. R.
Priest, J. D.
Rodman, W. W.
Roschen, F. P.
Rosin, M. K.
Rund, C. D.
Ryan, J. M.
Saine, B. D.
Satz, M. L.
Scheibel, R. L.
Schneck, R. A.
Schotzko, J. R.
Schwartz, M. M.
Selmo, R. J.
Shronts, J. S.
Singer, A. D.
Spilane, M. T.
Steldt, A. O.
Stenberg, M. D.
Strand, V. F.
Tempel, J. W.
Tendall, J. S.
Torstenson, O. L.
Tschida, V. H.
Vigneri, J. M.
Vitko, R. J.
Wennberg, D. W.
Westafer, R. W.
Westburg, S. P.
Yablonski, M. E.
Zimmerman, B. R.
Zimmerman, D. E.

Alumni Deaths

◆ **1918**

Dr. Edward Dyer Anderson, Gstaad, Switzerland. Died May 26, 1967 at the age of 75 years, having lived in Switzerland following his retirement from the University of Minnesota in 1954. He was a clinical teacher in the Medical School's pediatrics department for 36 years, and served in both World Wars. Dr. Anderson was former president of the Hennepin County Medical Society.

◆ **1922**

Dr. Melvin F. LaViolette, Seattle, Wash. Died last January in Seattle of pancreatic cancer. He is survived by his widow, who lives at 7025 51st Ave. N.E., Seattle.

MEMORIALS

The Minnesota Medical Foundation acknowledges with gratitude recent contributions made in memory of:

Raymond G. Beckwith
Mrs. Inez Bradford
Eldred B. Colburn
Dr. Benjamin Derauf
Morton Feinberg
Maurice Gordon
Mrs. Alberta Hartman
Dr. Arthur C. Kerkhof
Mrs. Elizabeth Madden
John Sample
Dr. Armer H. Stolpestad

Memorial gifts are a thoughtful means of honoring the memory of a relative, friend, or colleague. They serve the living by strengthening medical education and research at the University of Minnesota Medical School. Gifts may be designated for specific purposes. The Minnesota Medical Foundation acknowledge all gifts to both donor and next of kin.

This is the concluding issue of Volume XXXVIII, University of Minnesota MEDICAL BULLETIN, which has been published monthly from September through June of the 1966-67 academic year. No issues are published in July and August. Publication of Volume XXXIX will begin in September, 1967.