

TRANSACTIONS

American Laryngological Association

NINETY-FIFTH VOLUME

1974

PUBLISHED BY THE ASSOCIATION
CHARLES FOSS FERGUSON, M.D., Editor



"DOCENDO DISCIMUS"

TRANSACTIONS
OF THE
NINETY-FIFTH ANNUAL MEETING
OF THE
American
Laryngological Association
1974

HELD AT
THE BREAKERS
PALM BEACH, FLORIDA
APRIL 26 AND 27, 1974

PUBLISHED BY THE ASSOCIATION
ST. LOUIS, MISSOURI
CHARLES FOSS FERGUSON, M.D., Editor

1974

Contents

	PAGE
Officers for 1973-1974	7
Annual Photograph	8
Registration of Fellows for Annual Meeting	9

* * * *

Comments of the President, G. Slaughter Fitz-Hugh, M.D.	11
Introduction of Guest of Honor, Robert L. Goodale, M.D.	16
Remarks of Guest of Honor	17
50th Anniversary of American Board of Otolaryngology, Dean M. Lierle, M.D.	18

SCIENTIFIC SESSION

Visible Laryngeal Changes During Voice Therapy: Fiber-optic Study. David W. Brewer, M.D. and Gerald McCall, Ph.D.	19
Some Aspects of Fetal Laryngeal Development. John A. Tucker, M.D. and Gabriel F. Tucker, Jr., M.D.	24
Surgical Correction of Subglottic Stenosis of the Larynx in Infants and Children: Progress Report. Blair Fearon, M.D. and Robin Cotton, M.D.	31
Multiple Postintubation Complications. Marshall Strome, M.D. and Charles F. Ferguson, M.D.	35
Discussion of preceding presentations: Paul H. Holinger, M.D.	41
John A. Kirchner, M.D.	42
Robin Cotton, M.D. (closing)	42
Fibrosarcoma of the Head and Neck: A Clinical Analysis of Forty Cases. Ronnie E. Swain, M.D., Donald G. Sessions, M.D. and Joseph H. Ogura, M.D.	43
Discussion: Charles M. Norris, M.D.	48
Panel: Voice Rehabilitation Following Laryngectomy. Moderator: John J. Conley, M.D.	49
Participants: Stanley Taub, M.D.	51
Robert Komorn, M. D.	55
William W. Montgomery, M.D. and William G. Lavelle, M.D.	62
Alden H. Miller, M.D.	71
John J. Conley, M.D. (closing)	74

CONTENTS

	PAGE
Experiences with the Carbon Dioxide Laser in the Larynx.	
Albert H. Andrews, Jr., M.D. and Harold W. Moss, M.D.	75
Discussion:	
M. Stuart Strong, M.D.	83
Blair Fearon, M.D.	84
Albert H. Andrews, M.D. (closing)	84
Reconstruction of the Tongue.	
Hugh O. deFries, D.D.S., M.D., Capt., U.S.N.	85
Total Reconstruction of the Hypopharynx with Tongue Flap and Dermal Graft.	
John M. Loré, Jr., M.D.	90
Laryngotracheal Autograft for Postcricoid Carcinoma: A Reevaluation.	
Max L. Som, M.D.	95
Discussion of preceding presentations:	
Douglas P. Bryce, M.D.	100
Hugh O. deFries, M.D. (closing)	101
John M. Loré, M.D. (closing)	101
Adenocarcinoma of the Larynx.	
James H. Whicker, M.D., H. B. Neel III, M.D., Louis H. Weiland, M.D. and Kenneth D. Devine, M.D.	102
Resection and Anastomosis of Cervical Trachea (Movie.)	
Paul H. Ward, M.D. and Muhammed Saffourie, M.D.	106
Discussion:	
Douglas P. Bryce, M.D.	106
Max L. Som, M.D.	106
William W. Montgomery, M.D.	106
John M. Loré, Jr., M.D.	107
Paul H. Ward, M.D. (closing)	107
Executive Sessions:	
First Session (April 26)	109
Second Session (April 27)	109
Reports of:	
Secretary, John F. Daly, M.D.	110
Treasurer, Charles M. Norris, M.D.	112
Accountant	115
Librarian, Historian and Editor, Charles F. Ferguson, M.D.	115
Research Fund Committee, ALA, David D. DeWeese, M.D.	116
100th Anniversary Committee, Alden H. Miller, M.D.	117
American Board of Otolaryngology, Frank D. Lathrop, M.D.	119
American Council of Otolaryngology, ALA Representative, Stanton A. Friedberg, M.D.	119
American College of Surgeons, Board of Governors, William M. Tribble, M.D.	120

CONTENTS

	PAGE
American Council of Otolaryngology, Executive Director, Col. Harry McCurdy, M.D.	122
Man-Power Analysis Study, G. Slaughter Fitz-Hugh, M.D.	123
Nominating Committee, Francis W. Davison, M.D.	125
Third Session (April 27)	125
Memorials:	
Victor R. Alfaro, M.D.	129
Joseph P. Atkins, M.D.	131
Gordon D. Hoople, M.D.	135
Percy E. Ireland, M.D.	137
John S. Knight, M.D.	139
Francis L. Lederer, M.D.	141
Benefactors	143
Recipients of deRoaldes Award	144
Recipients of Casselberry Award	145
Recipients of Newcomb Award	146
Past Officers	148
Past Fellows	153
Roster of Present Fellows, 1974	163
Active	164
Honorary	170
Corresponding	171
Emeritus	171
Officers for 1974-1975	174
1964-1974 Index of Papers presented at Annual Meetings	
Authors	176
Subject	179
Index (1974)	
Authors	193
Subject	194

OFFICERS 1973-1974

* * * *

PRESIDENT

G. SLAUGHTER FITZ-HUGH, M.D.

FIRST VICE-PRESIDENT

WILLIAM H. SAUNDERS, M.D.

SECOND VICE-PRESIDENT

BLAIR FEARON, M.D.

SECRETARY

JOHN F. DALY, M.D.

TREASURER

CHARLES M. NORRIS, M.D.

LIBRARIAN, HISTORIAN AND EDITOR

CHARLES F. FERGUSON, M.D.

* * * *

COUNCIL

The above ex officio and

FIRST COUNCILOR

ALDEN H. MILLER, M.D.

SECOND COUNCILOR

DeGRAAF WOODMAN, M.D.

THIRD COUNCILOR

F. JOHNSON PUTNEY, M.D.

FOURTH COUNCILOR

FRANK D. LATHROP, M.D.



FELLOWS IN ATTENDANCE AT THE NINETY-FIFTH ANNUAL MEETING

Front Row (standing, left to right): Daly, Woodman, Saunders, Fitz-Hugh, Fearon, Goodale, Ferguson, Norris. *Second Row*: Dedo, Farrior, King, Moore, O'Keefe, Cocke, Ritter, Weaver, LeJeune, Lewis, Lore, Som, Putney, Ogura, D. Miller. *Third Row*: Tremble, Jones, Tabb, Murtagh, Clerf, Hilding, Cracovaner, Lewy, Goldman, Tribble, Harris, DeWeese, Holmes, Andrews, Pratt, Hanckel, Snow, Hudson, Kirchner. *Fourth Row*: Davison, Brown, Holinger, Suehs, Friedberg, Frazer, R. Williams, Ballenger, Alford, Soboroff, Munoz-MacCormick, Schall, Smith, G. Tucker, Brewer, McNally, Ward, Simonton, Cohen, Baker, Bryce, Conley.

TRANSACTIONS OF THE
NINETY-FIFTH ANNUAL MEETING

OF THE

American Laryngological Association

HELD AT

THE BREAKERS

PALM BEACH, FLORIDA

APRIL 26 AND 27, 1974

* * * *

The Ninety-fifth Annual Meeting of the American Laryngological Association was called to order by the President, G. Slaughter Fitz-Hugh, M.D. in the Venetian Room of The Breakers, Palm Beach, Florida on Friday, April 26, 1974 at 8:05 A.M.

REGISTRATION OF FELLOWS

ACTIVE

ALFORD, BOBBY R.
ANDREWS, ALBERT H., JR.
BAKER, DANIEL C., JR.
BALLENGER, JOHN J.
BAXTER, JAMES D.
BORDLEY, JOHN E.
BREWER, DAVID W.
BROWN, LESTER A.
BRYCE, DOUGLAS P.
CHANDLER, J. RYAN
COCKE, EDWIN W., JR.

COHEN, SEYMOUR R.
CONLEY, JOHN J.
CRACOVANER, ARTHUR J.
DALY, JOHN F.
DAVISON, FRANCIS W.
DEDO, HERBERT H.
DEVINE, KENNETH D.
DEWEESE, DAVID D.
FARRIOR, RICHARD T.
FEARON, BLAIR
FERGUSON, CHARLES F.
FITZ-HUGH, G. SLAUGHTER

FRAZER, JOHN P.
 FRIEDBERG, STANTON A.
 GOLDMAN, JOSEPH L.
 HANCKEL, RICHARD W.
 HARRIS, HERBERT H.
 HILDING, ANDERSON C.
 HOLINGER, PAUL H.
 HOLMES, EDGAR M.
 HUDSON, WILLIAM R.
 JONES, EDLEY H.
 KING, JAMES T.
 KIRCHNER, JOHN A.
 LATHROP, FRANK D.
 LEWIS, JOHN S.
 LEWY, ROBERT B.
 LORE, JOHN M., JR.
 MCGOVERN, FRANCIS H.
 MILLER, ALDEN H.
 MILLER, DANIEL
 MONTGOMERY, WILLIAM W.
 MUNOZ-MACCORMICK, CARLOS
 NORRIS, CHARLES M.
 OGURA, JOSEPH H.
 O'KEEFE, JOHN J.
 PASTORE, PETER N.
 PRATT, LORING W.
 PUTNEY, F. JOHNSON
 RITTER, FRANK N.
 SAUNDERS, WILLIAM H.
 SILCOX, LOUIS E.
 SIMONTON, KINSEY M.
 SNOW, JAMES B., JR.
 SOBOROFF, BURTON J.
 SOM, MAX L.

SUEHS, OLIVER W.
 TABB, HAROLD G.
 THORNELL, WILLIAM C.
 TRIBLE, WILLIAM MACL
 TUCKER, GABRIEL F., JR.
 TUCKER, JOHN A.
 WARD, PAUL H.
 WEAVER, DELMAR F.
 WILLIAMS, RUSSELL I.
 WOODMAN, DEGRAAF

HONORARY

CLERF, LOUIS H.
 LIERLE, DEAN M.

EMERITUS

GOODALE, ROBERT L.
 KLINE, ORAM R.
 LEJEUNE, FRANCIS E.
 McNALLY, WILLIAM J.
 MOORE, PAUL M.
 MURTAGH, JOHN A.
 SCHALL, LEROY A.
 SMITH, AUSTIN T.
 TREMBLE, G. EDWARD

SCIENTIFIC SESSIONS

The first Scientific Session of the Ninety-fifth Annual Meeting, held in the Venetian Room of The Breakers, Palm Beach, Florida, convened on Friday, April 26, 1974 at 8:30 A.M. The President of the Association, G. Slaughter Fitz-Hugh, M.D. of Charlottesville, Virginia was in the Chair for the first session.

COMMENTS OF THE PRESIDENT

G. SLAUGHTER FITZ-HUGH, M.D.

Fellows of the American Laryngological Association: I welcome you to its Ninety-fifth meeting, and also bring to your attention that it will not be long before we will be observing our centennial year. Plans have already been initiated by your officers for this occasion.

Protocol prescribes for an address, comments or remarks by the president. In perusing the past *Transactions*, as I am sure all presidents have done, I note that this custom has been adhered to. Some of the addresses have been superb ones and have revealed the scholarly capabilities of the individuals. In the other categories, such as comments, remarks, etc., we have profited by reminiscences, admonitions, and other thoughts of the speaker — all entertaining and illuminating. Now approaching the end of my academic and administrative career, I have found myself reminiscing, as all will do. In doing so one will inevitably compare the past and present trends which have influenced medicine (and specifically otolaryngology). I will confine my remarks to the more recent developments having to do with medical education, sociologic dimensions of health, and the variety of input by the federal government into our profession in various ways.

If a title is necessary, then my remarks — and by no means can they be placed in the more scholarly category

of an address — will be "Trends in Otolaryngology."

Many of the changes in the direction of the various aspects of our specialty have been predicated upon the involvement of government in the affairs of medicine — many commendable, but some objectionable.

Initially, students, medical educators, health administrators and others were not fully aware of the time requirement factor in medical education; that is, the relatively available time for the accumulation of acceptable medical knowledge by student graduates versus the enormous amount of rapidly developing additional scientific knowledge with which they were confronted. The awareness that something more than hard science would be of value to the producer and recipient of health care became evident. Thus the need for more exposure to the humanities of medicine and even prosaic subjects, such as the legal and economic aspects of becoming a physician in the deliverance of health care, demanded consideration. To include all of these new items in the educational process, it was obvious that it would be inadvisable to expand the time factor; that is, additional pre- and postdoctoral schooling. There was the increasing cost consideration in the production of a physician and the alleged need for more of them in a short period of time (incidentally a

question that is creating considerable debate), as some of the reasons that the time extension was not feasible. Something had to give, so to speak, so there had to be a change in the requirements. Then the status of what was relevant, and that less relevant in teaching had to be established by the educators, supposedly to satisfy the government, public and students. First to suffer in time by deletion were the basic sciences universally, and surgical specialties in many incidences, otolaryngology being one.

Another method adopted to correct or improve the health care situation was to create more schools, increase the number of students in the existing ones, abolish vacation periods, and as a form of appeasement and liberality to introduce to the students and many educators the now so dominant component, "The Elective," into the educational scheme. The spin-off from these various new dimensions in education is something that is not totally desirable and to some rather unacceptable, but apparently a necessity for many reasons, some already mentioned. One that is not openly discussed is the result of the present surge in all aspects of our society to aid the underprivileged, certainly most commendable. This has led to a problem, that is, the inevitable development of a two-standard situation in the entrance requirements for medical schools and also the same for advancement purposes once in school. This is an unfortunate situation at the present time, and should be temporary, as the necessity for such can be resolved by newer educational facilities and progress at the grass roots or more elementary levels. Time does not allow interesting descriptions of how the administrators and educators are managing these problems. All those having any connection with medical schools are now familiar with the term "decompression."

To move away from generalities and now to items more specifically related to otolaryngology, I would like to make some comments as to trends in curricu-

lum, postdoctoral training and peer review.

CURRICULUM

As has been previously alluded to, the necessity for deleting certain course requirements to make room for those considered more relevant and up-to-date in many schools, the elective program serves as a partial solution to fulfilling the needs of the students within the available time structures. In other words, those courses which had been formerly allocated eighteen hours or so of didactic classroom contact, usually in the fourth or third years enabling presentation to the entire class the clinical substance of our specialty, in many schools have been greatly curtailed in time or eliminated. As a substitute, electives in these courses are offered. Generally surgical specialties suffered. I dare say less than one-half of the disciplines of otolaryngology at the present time in medical schools throughout have appreciable time in which entire classes are tutored in the specialty. Thus, a number of students are graduated without the barest knowledge, if any at all, of diseases of the upper respiratory and digestive tracts, common areas of pathological manifestations. Who will suffer? Obviously the recipient of health care. Elective courses in otolaryngology in most medical institutions have compensated in part for this lack of preparedness. An advantage offered by the elective system is in those who choose such, and one will find an interesting and highly motivated group of clerks who are a pleasure to work with. Another equalizing mechanism is that those who are entering the ever increasingly popular family practice residencies are in many areas receiving otolaryngologic exposure. The product of the family practice programs will be the physician of choice in the future, as the result of the mandate of the population and the government which will be providing the funding of health care for a large segment of the population. I personally, and rather selfishly so, have had exposure in both methods of teaching, and

am becoming more fond of the elective one. Informal teaching is certainly to me more attractive than the formal means.

Interestingly enough, as the administrations have so enthusiastically endorsed the elective and free-time periods in education, there is beginning to be a backlash to this method of instruction. One is hearing more and more often of student groups who have been exposed to the modern approach — they have found it in many respects lacking and are requesting a reassessment of the old formality versus the newer informality.

As one knows, the motivation to become an otolaryngologist is more often initiated in medical school; the decrease in contact with the students will probably not significantly modify these decisions if a good elective program is available. There is no question in my opinion that the trend between required versus elective exposure will eventually swing back to the former in popularity. It appears to me that the good graduate students like to be challenged, and this comes about by the process of a more formal examining process and specific grading to determine the progress, not the opposite.

POSTDOCTORAL TRAINING

The trends in postdoctoral or actually resident training in otolaryngology are beset with variations and requirements, length of service, etc., under the edicts of the American Board of Otolaryngology, and the Residency Review Committee for Otolaryngology. Presently the only constant factor is that all programs must consist of one year of general surgery, the contents of which may be quite flexible. There are five, four and three-year programs in otolaryngology per se. The year of general surgery (this term is becoming obsolete in favor of basic surgery) experience may be included in the program (e.g., four or five year ones), or as in the case of the three-year programs a requisite prior to entering the program. The year of internship, as such, is to be abolished

by July 1975, and with the accelerated programs in medical schools for graduation in three years, just what the most desirable training in otolaryngology will consist of is debatable. It seems to me if we are to promote the wide field aspects of otolaryngology, as the general trend is at the present time, then we must insist upon two years of basic surgery if we are to compete successfully with our colleagues interested in the same areas, the plastic and general surgeons.

There are others who are under the impression that our programs are producing too highly trained otolaryngological surgeons who for obvious reasons are less inclined to settle in the smaller cities and communities where they are most needed in the joint effort to satisfy or improve health care. The obvious solution would be making available postdoctoral programs that are more or less medically oriented and others emphasizing the surgical aspects of otolaryngology. The former would require a shorter period of training and perhaps the recipient would be more inclined to forego the competition and turmoil of the more populated areas in favor of the smaller ones. I believe I can note a current trend for even those highly trained graduates to settle in lesser populated areas even now. It is not inconceivable that the federal government might make overtures to solving the problem of maldistribution of physicians by monetary inducement plans. The division of the postdoctoral otolaryngologic programs would be beset with many problems such as certification, hospital privileges and teaching plans, to mention a few. At the present time and under the present circumstances, it is my thought that one will find "few takers" for an abbreviated and less sophisticated training experience. The role of a "secondary citizen" is in the main unacceptable to graduate medical students.

PEER REVIEW AND PSRO

Recently in *Prism* (October, 1973) an article was published, the introductory

sentence of which was as follows: "Last year, as an amendment to the new Social Security Bill, Congress passed a provision that required setting up, by 1976, a so-called Professional Standards Review Organization (PSRO), a peer review system to monitor medical services paid for, wholly or partially, under the provisions of the Social Security Act." Initially the prime concern of these organizations will be a review of care provided for Medicare, Medicaid, child health services, hospitals, extended care facilities, and nursing homes. Eventually PSRO may monitor all services paid for, wholly or in part, funded by the federal government, and also may attempt to govern all who will professionally provide these services. With the increasing interest of the federal government in health services, it behooves all individuals and groups of physicians to become less indifferent and more knowledgeable in professional and socio-economic affairs related to medicine and particularly to our specialty. There is fortunately a trend to do so as we have several organizations promoting such interests.

What is in store for us as a result of the activities of the Professional Standards Review Organization (PSRO), the Cost of Living Council, the Food and Drug Administration, and other less publicized government organizations whose objective is to influence health care? We have seen the rapid expansion of Medicare and Medicaid coverage, mostly desirable, but some less so, since the original conception of these services. The rapidity of these movements has resulted in ill-defined and thoughtlessly proposed guidelines. Witness some of the dictates of the Food and Drug Administration.

A fact-finding trend is evident in otolaryngology. The reasoning for this is that if we have available factual and indisputable information with regard to the direction in which our specialty is moving to supply the health needs of the population, then when the government's peer review, or what have you, needs information by request or other-

wise, it will be readily available. To combat or reason with the government, one must have documented information, and nothing is more effective than numbers and expressions in percentage figures.

Foremost, the most exhaustive surveys will be those prepared by the Manpower Analysis Committee of the American Council of Otolaryngology with support from the National Institute of Neurological Diseases and Stroke, a much welcomed exhibition of cooperation by HEW. Other organizations participating to a lesser degree are the American Speech and Hearing Association, the Academy of Neurology and that of Neurosurgery. Preliminary reports indicate that an abundance of useful material, particularly relevant to otolaryngology, will be forthcoming in the future. The data is such that I predict that it will be of keen interest to even our most indifferent colleagues.

Incidentally, a somewhat similar survey, is that in which manpower, government relationships, etc., are some of the items being considered by the American College of Surgeons and its committee, The Study on Surgical Services for the United States (SOSSUS).

The American Academy of Ophthalmology and Otolaryngology, certainly one of the first and finest organizations sponsoring continuing education anywhere, also is considering the needs and desires of specific items related to health care. Its committee on surgery of the Head and Neck has appointed subcommittees on head and neck manpower and the desirability for joint multidiscipline services in the medical center.

Undoubtedly, the Departments or Divisions of Otolaryngology in the various medical centers must be the most prolific producers and enthusiastic supporters of continuing education. The seminars, symposia, and conferences offered to the physician and ancillary medical personnel are innumerable and seem to be increasing yearly. The subject matter covers instruction in every imaginable subspecialty that an oto-

laryngologist could desire: allergy, audiology, otology, labyrinthine function, plastic surgery, reconstructive surgery, etc. Peer review, as envisioned by the federal government, may be one motivating factor in this trend.

There are other organizations exhibiting interest in what is happening in the academic environment of our specialty and in future federal government planning, namely, the Society of Academic Chairmen of Otolaryngology and the Society of University Otolaryngologists. Each group has sponsored studies relative to health care, mainly at the academic level.

There is a definite favorable trend in improving the rapport between otolaryngologists and members of the other specialties having a common interest in certain areas, particularly head and neck, and allergy. A recent successful

joint meeting between the Society of Head and Neck Surgeons representing general surgery, and the American Society for Head and Neck Surgery representing us, was a demonstration of this trend. This is very gratifying, but there are individuals in each of our groups who are less inclined to embrace these ecumenical tendencies who may or could create discord indirectly through peer review. We must not reduce our vigilance or become indifferent, but participate and become knowledgeable about what is being done around us.

In closing I would like to thank the secretary, the vice-presidents, and members of the Council who have been most helpful to me during the past year. A splendid joint effort was responsible for this program which I hope you will find profitable and entertaining.

INTRODUCTION OF GUEST OF HONOR, ROBERT L. GOODALE, M.D.

G. S. FITZ-HUGH, M.D., PRESIDENT

One of the privileges of the President of this Association is to choose a Guest of Honor. It is my pleasure to present to you my choice — a New Englander with whom I first became acquainted when he and his gracious wife were the guests of our state Society of Ophthalmology and Otolaryngology on a cruise visiting Cuba, Nassau and other southern points in 1956. Since then, my wife and I have been fortunate in being able to renew our acquaintances from time to time.

My guest has a scholarly background. His grandfather and father were scholars, the latter an otolaryngologist. He was educated, naturally, at Harvard College and the same institute's medical school. His postdoctoral training was obtained, again naturally, in Boston, at Boston's Children's Hospital and Massachusetts Eye and Ear Infirmary. He also served a preceptorship under Dr. Mosher. Subsequently he became affiliated with Harvard Medical School as a Clinical Assistant Professor and had appointments as a consultant and member of the staff of many hospitals in the area. He is a member of all of the medical societies that one would anticipate and is past president of the New England Otolaryngological Society and past vice-president of our Association, having become a member in 1940. He is a past member of the Editorial Board of the *New England Journal of Medicine* and *Archives of Otolaryngology*.

In perusing his bibliography, which includes 20-odd papers, one readily sees that his special interest in otolaryngology had to do with the management of frontal sinus disorders. We are all familiar with his perfection of the obliterative surgical technique in frontal sinus disease; a contribution that has been so successful in the management of those most troublesome problems.

In doing my homework, I had the opportunity of mentioning to some that my guest was one of their colleagues. All were delighted to hear that he would be a participant of this meeting, and such comments of admiration and affection were forthcoming. "His enthusiasm, perseverance, and determination are responsible for the solution of how to deal with the surgical problems of chronic frontal sinusitis." "His father was much admired in Boston as a pioneer in dealing with allergy problems; he followed in his father's footsteps." "He was always considerate of residents and willing to listen to their views and to give them responsibility in surgery, not always an attribute of attendings." A remark on an information survey sheet was simply "conservative person."

Our guest retired from the practice of otolaryngology some few years ago, leaving behind an enviable record as a practicing otolaryngologist, academician and teacher, but not to become a product of idleness. He continues his interest in various activities such as the historical events of his native area, ornithology and horticulture. He is now trustee of the Massachusetts Horticultural Society, a member of the Conservation Commission of the Town of Ipswich, and a member of the local committee of the R. T. Crane Memorial Reservation, a part of "The Trustees of Reservation."

Thus, we have a profile of our guest: a gentlemanly New Englander with an ever-recognizable Boston accent, a family man with an attractive and companionable wife, an illustrious record as a practitioner, scholar and teacher, a record as an outstanding contributor to the management of various specific medical problems, retired but not retired, who has all the qualities that our younger members should attempt to emulate — Dr. Robert L. Goodale.

REMARKS OF GUEST OF HONOR

ROBERT L. GOODALE, M.D.

I am deeply touched by the honor you have bestowed on me. At a time like this one asks, "Why me?" It must be that I have done something right! But I do not recall anything that was that right, although you reassure me that I have not done some wrong things in my career. In a search for the answer I did look into my past. When I taught laryngology at Harvard, I frequently asked the students why they decided to go into medicine. The answer was invariably the same, "Back home I knew a doctor." I suspect it was a standard form reply for purposes of admission to medical school. So I began to ask myself, "Why did I become a laryngologist?" and the answer was the same. When I was four years old, my father, Joseph L. Goodale, who had just been elected to this Association, took me into his examining room, put a head mirror on my head, a tongue depressor in my hand, and showed me how to examine those horrid things called tonsils. The next morning he asked me if I wanted to have my tonsils out before breakfast or play with Helen, the little girl next door. I replied, so it is said, "I would rather have my tonsils out!" This was promptly accomplished.

From then on I was aware of medicine. In my family there were doctors to the right of me, doctors to the left of me, and they "volleyed and thundered." I began to hear names of famous men: Delavan, Knight, Coolidge, Green, Hooper, Mosher, Sir St. Clair, Thompson, and Morrel MacKenzie. "These were giants in those days." By the time I had entered medical school I already knew many of them as friends of the family. What I knew was not their expertise as surgeons so much as their human qualities, their concern for their patients, willingness to listen to

the tribulations of others, and their essential humility. They were never dogmatic for they knew that dogma is the opiate of science.

To these men, who later became my teachers and under whom I trained at the Massachusetts Eye and Ear Infirmary, I owe a great debt. They inspired me, gave me that "God within" called enthusiasm, the daimon to drive on ahead, and the inquiring mind.

Doctor Mosher was my sponsor and gave me my first chance to speak to this Association at Atlantic City in 1938. I owe much to him and later to Doctor Schall for backing me up on many occasions, to the other senior staff members for their cooperation and counsel in difficult cases, to the membership of this Association for invitations to speak at meetings here and abroad, to the assistance of the house staff of the Infirmary, to my secretaries for their untiring labors in typing and retyping my papers, and finally, and by no means the least, to the patient encouragement of my wife. If I have ever done anything right it was due to all of these.

I would like to speak briefly on another theme. This week we have heard about Philadelphia and a story was told that someone thought the best thing about their city was the train to New York. Well, about 240 years ago a lad from Boston thought the best thing about his city was the first boat to Philadelphia! He took it. Later he paved its streets, gave it enlightenment by installing street lamps and starting a newspaper, and had a hand in making it the cradle of American Liberty. Significantly he bore the name of Franklin, the ancient Anglo Saxon for a "Free Man."

50TH ANNIVERSARY OF AMERICAN BOARD OF OTOLARYNGOLOGY

DEAN M. LIERLE, M.D.

When Dr. Bradley asked me to speak he said there were two restrictions; one, that it is to be extemporaneous and second, that I could have three minutes! I wonder what motive he had in that!

I would like to say a few words about the accomplishments of the American Board of Otolaryngology. I think they should be very proud of their achievements.

Although the Board was established in 1924, the first examination was in 1925. The requirements for the examination were an apprenticeship under an otolaryngologist, or a year of training in an accepted training center.

We now have one year of surgery and three years of otolaryngology. Our requirements are comparable to those of any other surgical specialty and in some respects I think they are better. The internship has been done away with as you know and only time will tell whether this was a wise thing to do.

I want to remind you that these are minimal requirements. Several of our institutions require four years of training in otolaryngology and many of our private practitioners and those who are going into teaching and/or research take additional training.

The next achievement was the modernization of the examination. You may recall that five or six years ago we had

part of our examination in hospitals with patients, but the number of candidates had increased so that it was necessary to change the type of examination.

I believe we were the second board to modernize our examination procedure by having a psychologist plan our examination, making it possible to computerize our results. I think the orthopedic surgeons were the first.

I must give credit to the cooperation of all otolaryngologists and our special societies. You must remember that the Academy has done a great deal to promote continuing education and provide a multiplicity of outstanding instructional courses.

The Triological now requires a thesis. All of our other societies have given awards for research which has greatly improved the quality of otolaryngology.

This Society has been particularly valuable in giving awards such as the Casselberry, the Newcomb and the deRoaldes prizes. These awards I believe do improve the quality of practice.

We now have many problems in regard to the future of otolaryngology. I am sure you are aware of many of these. Among them of course is the question of continuing education and second, the recertification which may or may not come. But with the present leadership of the Board and our Societies, I have no fear for the future of Otolaryngology.

VISIBLE LARYNGEAL CHANGES DURING VOICE THERAPY

FIBER-OPTIC STUDY

DAVID W. BREWER, M.D.

GERALD MCCALL, Ph.D.

SYRACUSE, N.Y.

SUMMARY—Use of a flexible fiber-optic naso-laryngoscope has permitted visualization and identification of laryngeal structures and various abnormalities in patients difficult to examine by mirror laryngoscopy. It has already made possible a fuller appreciation of laryngeal appearances related to both normal and to disturbed physiology. In addition, it has been possible to observe the larynxes of three patients during the use of such therapeutic procedures as use of loft register, yawn, sigh, and voice focus; to hear the therapist's requests of the patients; and to observe the patient's immediate laryngeal response as well as listen to his audible response. Such information now makes possible a more definitive treatment plan. As treatment is carried out, documentation of progress and reevaluation is greatly enhanced. The teaching value of this in a field which has had to rely primarily on empirical concepts in the past is noteworthy. Since multiple observers are permitted with the combined laryngoscope video-tape equipment, common bases of image simultaneous with sound, may assist in the development of a workable nomenclature for the many scientific disciplines engaged in research in voice and its major role in the broad field of human communications.

Laryngologists in particular are aware of the complexities of the laryngeal adjustments which permit a respiratory valve to play many additional roles—in coughing, swallowing, mucus clearing, whispering, shouting, speaking, and singing. All of these roles not only interrupt the normal respiratory cycle, but call into play additional mechanisms for producing varying degrees of vocal cord adduction, tension, thickness, and length. For clear phonation, not only is adduction required, but also normal synchrony and periodicity of vocal fold vibration. The speech process requires even more of the larynx. Vowel production as a primary laryngeal function is readily accepted. However, consonant production, even production of voiceless consonants such as p, s, f, and ch, requires the larynx to engage in appropriate gestures that are necessary for the momentary cessation of vibration.

In addition, speech requires the larynx to make adjustments necessary for producing variations in pitch intensity and quality of the voice. Finally, though utilized less often, the normal larynx has the capability of producing voice in different registers.

Laryngeal pathology frequently disturbs the physiological processes required for speaking. And, as one might suspect in many instances, disturbed physiology is suspected as being of prime etiological significance in producing laryngeal pathology. The reversal of disturbed laryngeal physiology then becomes a common essential treatment goal for the effective management of certain laryngeal pathologies.

Speech pathologists, voice therapists, and some singing teachers by now have built up an impressive series of carefully managed patients whose voice

From the Laryngeal Physiology Laboratory, Department of Otolaryngology and Communication Sciences, SUNY, Upstate Medical Center, Syracuse, N.Y.

problems have improved or disappeared. By using a variety of techniques various vocal deficits have been corrected. To explain the precise mechanisms involved in anatomical and physiological terms, and to have these explanations widely accepted, has not yet been possible. Differences in terminology and background have prevented laryngologists and voice teachers from developing an acceptable nomenclature. The scientific terminology of physics, both in aerodynamics and acoustics, and the roles of electrophysiology and neurolinguistics, all make for a divergence, rather than a convergence, of shareable knowledge in the field of voice production.

It was nearly fifteen years ago that electromyographic confirmation of the results of a particular vocal therapeutic program were reported to this society by Faaborg-Andersen, Briess, and one of us. Ten years ago, in an effort to actually see the changes in vocal cord function suspected to be responsible for various benign lesions of the larynx, as well as the changes occurring during their therapeutic treatment and disappearance, a fiber-optic naso-laryngoscope was designed in conjunction with the American Cystoscope Company. Several changes in design were delayed because of production schedules and although an image of the larynx was obtained, its clarity and illumination were not sufficient for photographic purposes. It was not proximally controllable and it was sufficiently flexible to be quickly flipped into the lateral food channel each time the patient swallowed.

Not long after this, Dr. Sawashima, working independently in Tokyo and with the Olympus company, devised a vocal cord scope which answered these problems. His subsequent work with Dr. Franklin Cooper at the Haskins Laboratories in New York City was reported at the San Francisco meeting

of this association in 1971.¹

By attaching a teaching bundle to the fiber-optic laryngoscope a second observer may see the larynx. Black and white or colored movies using a 16 mm reflex movie camera have been made. However, an image without sound is satisfactory only for gross appearance but not for readily identifiable function. By attaching the scope to a television camera multiple observers may simultaneously share the examination. Permanent recording of images can be made on either black and white or color tape television tape recorders and permit immediate playback for study and teaching. Movies with sound by camera require a considerable delay for film processing. Sound movies can be obtained commercially direct from video tape but require some loss of sharpness of image.

The purpose of this presentation is to illustrate the use of a flexible fiber-optic laryngoscope in the study of some physiological changes that we have observed in patients resulting from therapeutic procedures frequently utilized by speech pathologists. Specifically, three patients are used to illustrate physiological changes in the larynx elicited by three therapeutic procedures.

METHOD

An Olympus fiber-optic laryngoscope* was connected by a C-mount adapter to a Commercial Electronics color videoscope** with an RCA IVC one inch color tape recorder.*** An ACMI 1000 FCB Fiber-optic light source† (diagnostic source only) was used and a lavalier neck microphone, dynamic type, picked up the voice sounds for simultaneous voice recording (Fig. 1).

Cetacaine®‡ was sprayed on straight and curved cotton dressed wire applicators which were then carried twice along the floor of the nose to the posterior naso-pharyngeal wall, and then twice behind the palate up into the nasopharynx. Subsequently, the flexible

* Type O, Olympus Medical Instrument Div., New Hyde Park, N.Y.

** Model 410, Commercial Electronics Co.,

*** Series 800, RCA Electronic Components, Harrison, N.J.

† American Cystoscope Makers, Inc., New York, N.Y.

‡ Cetylite Industries, Inc., Long Island City, N.Y.

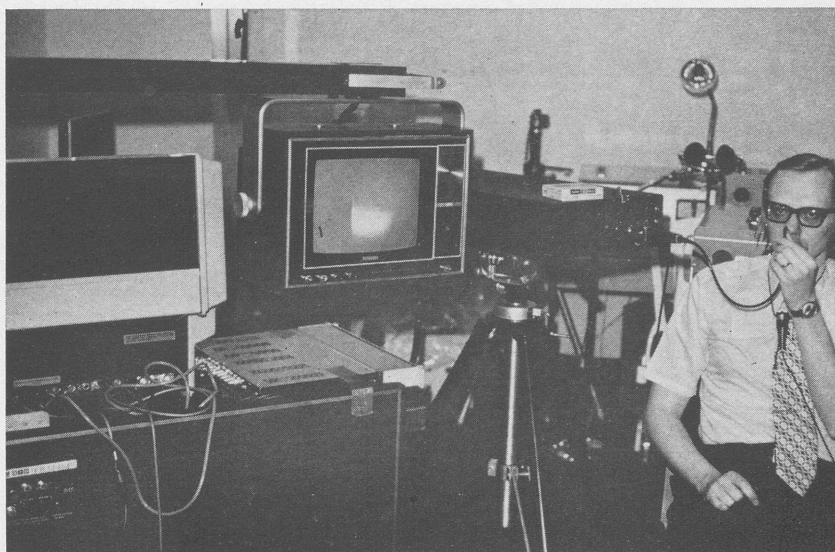


Fig. 1. The subject holds the flexible fiber-optic laryngoscope and can maneuver the distal end as directed by the examiner. From left to right — the tape recorder, television monitor, television camera, laryngoscope, and patient.

fiber-optic laryngoscope was introduced into one nasal fossa and passed through the nasopharynx into the hypopharynx. The distal end of the scope was varied in position from just above the tip of the epiglottis to a point near the petiolus depending on the tolerance of the patient and the maneuvers being observed.

Portions of video-tape were selected from the original recordings and edited for presentation. The selected sequences were then copied commercially on 16 mm color movie film with an optical sound track. For orientation, a brief portion of film of the larynx of a normal speaker indicated the usual appearance and position of the epiglottis, aryepiglottic folds, false cords, true cords, arytenoids, pyriform sinuses, and posterior pharyngeal wall as regularly seen with the fiber-scope. The false cords were seen to be well lateral to the true cords during phonation. The rapid opening and closing movements of the arytenoids during voiceless consonant production were noteworthy.

CASE REPORTS

Case 1. This was a forty-two-year-old white female with a chief complaint of

intermittent hoarseness and loss of voice for six to eight months. These symptoms had been attributed by the patient to "sinus trouble." Mirror examination of the larynx revealed approximation of the false vocal cords so closely together that only the posterior one-third remained slightly apart. Her voice was low pitched and husky. Fiber-optic laryngoscopic examination revealed that the false cords appeared to close even more tightly on coughing than on speaking. During throat clearing it was impossible to see the cords or false cords because of an overhanging epiglottis. On laughing, the false cords opened; the patient's voice was much higher pitched and was of normal vocal quality. These observations supported a tentative diagnosis of dysphonia plicae ventricularis of the functional dysphonic type.

The disturbed physiology in this patient was approached therapeutically by utilizing the loft register. This term has been used more recently to connote what has traditionally been called a "falsetto" voice. Physiologically, the larynx is raised and the vocal cords are near maximally lengthened and thinned

during loft register phonation. This voice can often be elicited from patients by asking them to imitate the "meow" of a kitty, the "howl" of a wolf, or the "whine" of a siren. As was observed in the film, the larynx assumes the accustomed posture as seen with the laryngeal mirror when the loft register voice is produced. From this posture the patient was ultimately able to move down into the normal speaking or "modal" register without evidence of dysphonia plicae ventricularis. During this transition, a noticeable lowering of the patient's larynx was observed with associated changes in the posturing of the arytenoid cartilages.

Case 2. This was a 57-year-old male with a chief complaint of hoarseness. He indicated that following open-heart surgery, his postoperative course necessitated the reinsertion of an intratracheal tube for a prolonged period on two occasions. Subsequent to its last removal his vocal symptoms appeared. Mirror laryngoscopy indicated the presence of dysphonia plicae ventricularis.

This patient's pitch range was markedly limited. He was unable to produce a loft register voice. He was able to produce a somewhat clearer voice with yawning and sighing suggesting at least partial reversal of interference with phonation by his false cords. His therapy program was based upon the use of the yawn and the sigh. In the film that followed the false cords no longer fully covered the true vocal cords; however, a marked tendency toward dysphonia plicae ventricularis persisted. Evidence of true cord vibration was seen between the partially open false cords. For reasons unknown his progress became arrested at this point and, although followed for a period of four months, no further progress was made. The residual problem appeared to be related, at least in part, to decreased respiratory support. This hypothesis received substantiation from subsequent pulmonary function studies.

Case 3. This was a 59-year-old college professor with a chief complaint

of persistent hoarseness and variable throat discomfort of two years duration. He had been unable to talk as loudly during this period and the longer he talked the more hoarse his voice became. He had a heavy teaching schedule and had always prided himself on having a stentorian voice. His larynx appeared normal except for mild superior surface edema of both vocal cords, and a strand of mucus forming and reforming between the tips of the vocal processes. His hearing was within normal limits in the left ear. A mixed hearing loss of moderate degree persisted in the right ear following chronic otitis media. His voice was low pitched, monotone, and hoarse. Through the fiberscope, the larynx appeared to show marked constriction of the glottic and supra-glottic areas on phonation with covering by the epiglottis. Again, the strand of mucus formed and reformed between the tips of the vocal processes, indicating a contact ulcer diathesis.

This patient's vocal problem was approached therapeutically by utilizing the concept of voice placement or focus. The procedure involves attempting to get the patient, by imitation or other means, to produce a voice that feels high and forward in the vocal tract. This feeling is similar to that which the singer experiences in what he terms the "head voice." (For lack of a better term, we are currently referring to this as a modal register head voice.) When producing this voice, all sensations of strain at the level of the larynx are removed. The voice does not feel as though it comes from the larynx, but has the feeling of emanating from the mouth, nose, or head. In the following sequence of film, a number of physiological changes were observed during the patient's production of a modal register head voice. Glottic and supraglottic constriction during phonation was noticeably decreased; covering of the cords by the epiglottis disappeared and the full length of the cords was seen. In addition, the previously observed strand of mucus no longer formed and reformed. The pitch of the voice was much higher

and the voice was clearer.

DISCUSSION

The fiber-optic flexible laryngoscope, when passed through the nose, has been used to advantage in a few patients, permitting visualization of their larynges when indirect mirror examination was impossible or inadequate.

Utilizing a minimum of topical anesthesia, it is possible to study both the normally functioning larynx as well as those larynges with disturbed physiology.

Therapeutic methods used in the treatment of abnormal voice production have necessarily developed empirically. Some individuals utilize a considerable degree of art in their management of patients with voice problems. The scientific bases for their successes and failures are presently the source of much conjecture and controversy. The flexible laryngoscope with the fiber bundle teaching attachment, or when attached to closed circuit television, now provides an excellent means by which there can be much closer collaboration between the otolaryngologist and the therapist and the other numerous team members in the broad field of laryngeal and voice investigation.

Instant playback is at once available instead of having to wait for movie film to be processed. Repeated immediate playbacks of the video-tape recordings often reveal new findings with each viewing. The most rapidly moving structure attracts one's attention, while slower motions of other structures previously ignored now become evident.

Habitual position of structures, for example, position of epiglottis during connected discourse, and the relationships

of epiglottis to arytenoids during usual voice production, may give valuable clues as to the type of disturbed physiology.

The use of this equipment makes possible not only a description of the endolaryngeal responses to requested sounds and maneuvers such as sighing, yawning, throat clearing, pushing, register change, and the various types of phonation, but the patient's visible, as well as auditorily assessed response to those requests, assist the therapist in developing a treatment plan.

In addition, this approach permits study of changes during the course of experimental therapy procedures, and immediate evaluation, as well as permitting study of serial changes during extended therapy when such is required.

Thus far, only endolaryngeal changes in motion, shape, structural position, mucus accumulation, and forceful contact have been observed. However, with auditory cues, and especially if combined with other single or multiple investigative techniques such as simultaneous fluoroscopy, airflow studies, electromyography, etc., much more information can be obtained regarding laryngeal function and dysfunction.

Finally, the visual image itself can now be added to the customary and often esoterically described auditory responses. Together they form a useful common ground for the reference of other parameters related to single utterances and also to connected discourse. A bringing together of the many and varied nomenclatures of the various branches of voice science may now be stimulated through a wider use of this combined investigative and therapeutic technique.

UPSTATE MEDICAL CENTER, SYRACUSE, N.Y.

ACKNOWLEDGMENT—The authors sincerely appreciate the assistance of Dr. George Reed, Professor and Chairman, Department of Otolaryngology and Communication Sciences, SUNY, Upstate Medical Center and Mr. Edward Elsner of the Television Division, Department of Educational Communications, SUNY, Upstate Medical Center, Syracuse, N.Y.

REFERENCES

1. Cooper FS, Sawashima M, Abramson AS, et al: Looking at the larynx during running speech. *Trans Am Laryngol Assoc* 92:69-73, 1971

SOME ASPECTS OF FETAL LARYNGEAL DEVELOPMENT

JOHN A. TUCKER, M.D.

GABRIEL F. TUCKER, M.D.

PHILADELPHIA, PENNSYLVANIA

SUMMARY — Some aspects of morphological and physiological development of the fetal larynx are presented. Histochemical confirmation and determinations of fetal glandular activity are needed. Anomalous development of the larynx is still conjecture, but congenital cystic formation with glandular development appears possible after the fifth month of human fetal life.

The intent of this presentation is to document some aspects of fetal laryngeal development and to define some problem areas that exist in attempting to classify and "stage" the chronological development of the fetal larynx.

The Carnegie system of staging¹ applies presently to the embryonic period, the first two months of intrauterine life, approximately eight weeks. The possibility of applying such a classification to development during the fetal period, the last seven months of 32 weeks till term (Fig. 1), should be considered. Because of the normal variation in individual growth rate, ¹⁻⁴ measurements of length C.R. (crown-rump) or C.H. (crown-heel) and total body weight are not valid to determine a true level of organ maturity. An accurate conceptual age, and date of last menstrual period (LMP) are "rarely if ever accurate."³ Birth itself is no criterion for term maturity of the newborn.^{5,6}

If one looks at the overall time of prenatal growth, the embryo and fetal periods together, from a generalized and oversimplified point of view, it becomes apparent that development of form and physiological function are oriented into discrete but overlapping periods. During the embryonic period, growth is a

highly sophisticated cellular interaction producing a dynamic migration and with establishment of resultant organ systems.

The view that the fetal period merely represents an extension of maturation of the dynamics of the embryonic phase is no longer valid. The realization of the comprehensive physiologic activity of the fetus as an entire integration of organ systems has added a new and exciting dimension to the interpretation of the fetal period.

Estimations of gestational or post-menstrual age of the newborn infant^{5,6} have used both physiologic and external criteria. Neonatal physiologic and morphologic criteria such as sweating, placental changes, parameters of the developing nervous system, fetal EKG, cytology of amniotic fluid, radiologic ossification centers, and skin characteristics of texture, color, edema, etc., have all been applied in attempting to determine an accurate level of maturity and/or developmental age in the newborn.

A recent comprehensive and detailed review of "the growth of the eye in utero"⁷ revealed that the developmental curve of the human eye was not smooth, but had many plateaus and breaks in

From the Institute of Laryngology and Human Communications, Hahnemann Medical College and Hospital, Philadelphia, Pa.

TABLE I*

DEVELOPMENT OF SOME OF THE MAIN FEATURES OF RESPIRATORY SYSTEM IN RELATION TO STAGING FROM THREE TO SIX POSTOVULATORY WEEKS

Stage 9	10	11	12	13	14	15	16	17	18
T U G E R O F	P H A R Y N X								
	LARYNGOTRACH.				Hypophar. eminence Arytenoid swellings Epithelial lamina	LARYNX		Vestib. outgrowth Cricoid condens.	Hyoid chondrif. Thyroid condens. Muscular condens.
	SULCUS								
			Tracheo- oesoph. septum	T R A C H E A					
	PULMONARY PRIMORDIUM	Lung bud		R+L Lung buds	R+L Lung buds	Lobar buds		Seg- mental buds	Some subseg. buds

* Modified from O'Rahilly and Boyden.⁸

development with spurts of growth. It would be reasonable to assume that such could also exist in laryngeal growth.

The present fetal collection at the Institute for Laryngology and Human Communications of the Hahnemann Medical College are from various sources: the Johns Hopkins fetal laryngeal collection on loan, which represents approximately 30 sectioned specimens and material from the Temple University laboratory of Dr. Gabriel Tucker; and in addition, the more recently acquired and processed specimens of the Institute.

Although the total collection approximates 60 fetuses, the background data and "stage" documentation is often inaccurate and only rough milestones of development can be calendared.

The need for a significantly large, closely graded series of well-documented fetal specimens to establish the

norm of laryngeal development is imperative. The problems of collection with scarcity of human laryngeal material and current dispersion of existing small collections, indicate the need for centralization of such a collection. National cooperation in collection and possible Armed Forces Institute of Pathology centralization should be considered.

LITERATURE

The postnatal laryngeal ventricle was first recognized by Galen in the second century and later by Morgagni in 1741 and Savart in 1825.⁸ Kallius in 1897 described evagination of the ventricle in a four-month fetus.⁹ Soulie and Bardier described two full epithelial buds at the junction of the lateral edges of the vestibular slit in the second month with ventricles (24 mm), and later beginning appendages at 37 mm at approximately 9 weeks (1907).⁹ As these were not staged human embryos, it is impossible

TABLE II
SPECIMENS STUDIED

Month	Weeks	Specimen	Coronal	Saggital	Horizontal	No.
3	9	CF-1		S		
		CF-2			H	
		LIA-8	C			4
4	12	CF-3		S		
	13	LIA-16		S		
		LIA-9		S		
5		LIA-15		S		4
	16	LIA-201	C			
	17	LIA-18	C			
6		LIA-19	C			
	20	LIA-411		S		4
		LIA-203	C			
7	21	LIA-17	C			
		LIA-21	C			
		LIA-11	C			4
8	24	LIA-22		S		
	25	LIA-135		S		
		LIA-28			H	
9		LIA-7	C			4
	28	LIA-27	C			
	29	LIA-245			H	1
10	32					
	33	LIA-256		S		1
	36					
10	37	LIA-24	C			
		LIA-252		S		2
	40					
Term						Total - 24

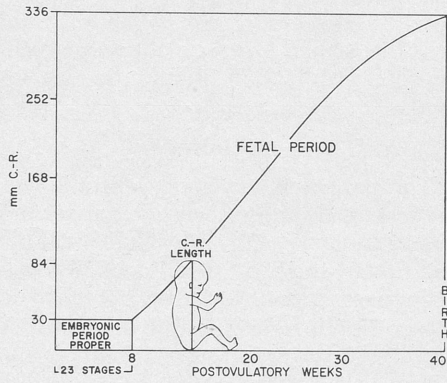


Fig. 1. The embryonic period proper, the first eight postovulatory weeks of development, is shown in relationship to the fetal period. Fetuses, as well as older embryos, are measured by their crown-rump length, which corresponds to the sitting height postnatally.

to make exact comparisons with the Carnegie Collection. Frazer described the laryngeal ventricle as being present by the end of the second month (in models) and well marked by the end of the third month.¹⁰

“The timing and sequence of events in the development of the human respiratory system during the embryonic period proper” has been recently summarized by O’Rahilly and Boyden¹¹ (Table I).

In review of the embryonic period of development, there is no visible sign of the respiratory primordium until after the formation of the foregut, and the median pharyngeal groove, at Stage 9.^{2,3} Stage 10-12, approximately 22-26 days, the laryngotracheal sulcus is evident.



Fig. 2. Paramedian sagittal section of a third month (9-12 weeks) Carnegie Collection Specimen No. 6658 fetus 40 mm in length. The triangular laryngeal ventricle is sharply outlined without glandular development (V).

Fig. 3. Horizontal section at the supra-glottic level of a third month Carnegie Specimen No. 6361 fetus 54 mm in length. The laryngeal saccule is suggested (A) and ventral fusion of the thyroid laminae is seen (B).

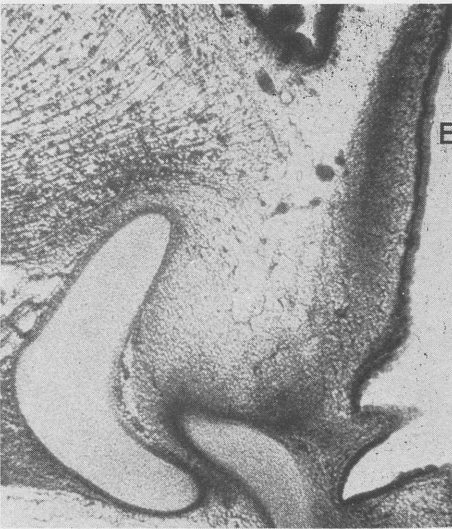


Fig. 4. Sagittal section of a fourth month Carnegie Specimen No. 1455 78.5 mm in length. No cartilage is as yet demonstrated in the epiglottis (E).



Fig. 5. Saggital section of fifth month Laryngeal Institute Specimen No. 411 140 mm in length. Fibroelastic cartilage is present in the epiglottis (E).



Fig. 6. Coronal section of a sixth month Laryngeal Institute Specimen No. 21 321 mm in length. Definitive glandular formation in the ventricle and saccule is observed (V).

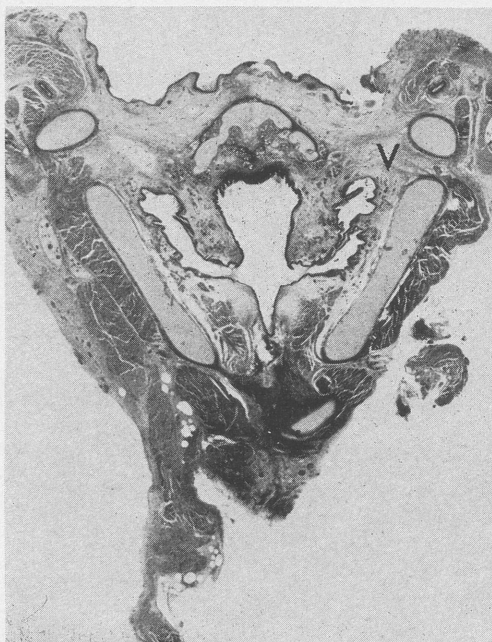


Fig. 7. Coronal section of a seventh month Laryngeal Institute Specimen No. 27 230.5 mm in length. Elaborate glandular formation is present (V).

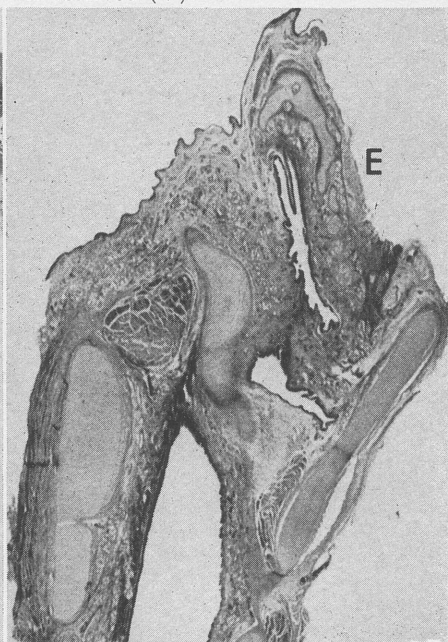


Fig. 8. Saggital section of an eighth month Laryngeal Institute Specimen No. 256 310 mm in length. The Omega-shaped epiglottic contours are defined (E).

At Stages 12-13, approximately 26-28 days, the tracheoesophageal septum is well under way. By Stage 14, approximately 32 days, the epithelial lamina of the larynx begins to develop. The hypopharyngeal eminence and right and left arytenoid swellings enable the site of the embryonic laryngeal inlet to be identified. At Stage 15-16, approximately 33-37 days, elaboration of the laryngotracheal and vestibulotracheal canals is visible. By Stage 17, approximately 41 days, the formation of the laryngeal vestibular outgrowths was noted.² The epiglottis becomes identifiable and cricoid condensation is beginning to appear. At Stage 18, approximately 44 days, lateral condensation of the thyroid lamina is seen. By Stage 19, approximately 48 days, the concavity of the epiglottis is illustrated. At Stage 20, approximately 51 days, continued vestibular development was illustrated. By Stage 21, approximately 52 days, early ventricle formation is suggested. At Stage 23, approximately 57 days, most all laryngeal structures are present. The laryngeal ventricle is well illustrated.

With the presence of bone marrow formation in the humerus, the fetal period begins. The organism is approximately 30-40 mm in length and eight weeks of age.^{2,3}

Fetal Observations. Twenty-four fetal specimens were studied and the following observations were made (Table II and Figs. 2-8).

Third Month (9-12 weeks)

The laryngeal ventricle is sharply outlined without glandular development (Fig. 2). The laryngeal saccule is suggested (Fig. 3). Ventral fusion of the

thyroid laminae is seen (Fig. 3).

Fourth Month

No cartilage is as yet demonstrated in the epiglottis (Fig. 4).

Fifth Month

Fibroelastic cartilage is present in the epiglottis (Fig. 5).

Sixth Month

Definitive glandular formation in the ventricle and saccule is observed¹² (Fig. 6).

Seventh Month

Elaborate glandular formation is present (Fig. 7).

Eighth Month

Omega shaped epiglottic contours are defined (Fig. 8).

CONCLUSIONS

Some aspects of morphological and physiological development of the fetal larynx are represented: 1) The laryngeal ventricle, which is first seen in the later stages of embryonic life is observed to more fully develop with glandular formation in the fetal period. 2) The thyroid cartilage fuses ventrally during the third month of fetal life. 3) The epiglottis is noted to form fibroelastic cartilage in the fifth month of the fetal period.

Histochemical confirmation and determinations of fetal glandular activity are needed.

Anomalous development of the larynx is still conjecture, but congenital cystic formation with glandular development appears possible after the fifth month of human fetal life.

INSTITUTE OF LARYNGOLOGY AND HUMAN COMMUNICATIONS, 230 NORTH BROAD ST., PHILADELPHIA, PA. 19102.

REFERENCES

1. O'Rahilly R: The early development of the eye in staged human embryos. *Contr Embryol Carnegie Instn* 38:1-42, 1966
2. Tucker JA, O'Rahilly R: Observations on the embryology of the human larynx. *Ann Otol Rhinol Laryngol* 81:520-523, 1972
3. O'Rahilly R, Tucker JA: Early development of the larynx in staged human embryos. *Ann Otol Rhinol Laryngol* (Suppl No 7) 82: 3-27, 1973
4. O'Rahilly R, Gardner E: Developmental stages in human embryos, including a survey

of the Carnegie collection. Part A: Embryos of the first three weeks (Stages 1 to 9), in *Carnegie Institution of Washington, D.C., Yearbook* 72. York, Pa, Maple Press, 1973, pp 87-89

5. Casaer P, Akiyama Y: The estimation of the postmenstrual age: a comprehensive review. *Dev Med Child Neurol* 12:697-729, 1970

6. Dubowitz LMS, Dubowitz V, Goldberg C: Clinical assessment of gestational age in the newborn infant. *J Pediatr* 77:1-10, 1970

7. O'Rahilly R, Bossy J: The growth of the eye, in utero. *Anales del Desarrollo* 16: 31-51, 1972

8. Hilton J: Description of the sacculus or pouch in the human larynx. *Guys Hosp*

Rep 2:519-525, 1837

9. Soulie A, Bardier E: Recherches sur le developpement du larynx chez l'homme. *J Anat Physiol (Paris)* 43:137-240, 1907

10. Frazer JE: The development of the larynx. *J Anat Physiol (Paris)* 44:156-191, 1910

11. O'Rahilly R, Boyden EA: The timing and sequence of events in the development of the human respiratory system during the embryonic period proper. *Z Anat Entwicklungs-gesch* 141:237-250, 1973

12. Tucker GF, Smith HR: A histological demonstration of the development of laryngeal connective tissue compartments. *Trans Am Acad Ophthalmol Otolaryngol* 66:308-318, 1962

SURGICAL CORRECTION OF SUBGLOTTIC STENOSIS OF THE LARYNX IN INFANTS AND CHILDREN

PROGRESS REPORT

BLAIR FEARON, M.D.

TORONTO, CANADA

ROBIN COTTON, M.D.

CINCINNATI, OHIO

SUMMARY—A survey of 25 consecutive cases of severe subglottic stenosis in children and infants, managed conservatively, revealed an unexpectedly high 24% mortality rate. A three year ongoing experimental study in infant primates indicated the feasibility of operative correction of subglottic stenosis without interference with usual laryngeal growth potentials. Initial results in the surgical correction of subglottic stenosis in two patients are very encouraging. For surgical correction of subglottic stenosis we recommend division of the cricoid and upper trachea anteriorly with interposition of autogenous cartilage, without removal of scar tissue, and without internal laryngeal stenting.

Two years ago at the Ninety-third Annual Meeting of this Association the authors¹ presented a preliminary report of a surgical procedure to correct subglottic stenosis in which growing monkeys were used as the experimental model. Now, we wish to report additional information obtained from this on-going study and its application in the management of two patients with severe and intractable subglottic stenosis.

THE CLINICAL PROBLEM

As yet there has been no satisfactory way of correcting the problem of severe subglottic stenosis in infants and children without the hazard of causing permanent damage to the developing larynx. As early as 1916, Logan Turner described stenosis of the larynx from intubation and tracheotomy.² Indeed the problem of severe acquired subglottic stenosis is on the increase as more and more critically ill patients sur-

vive prolonged periods of endotracheal intubation.³⁻⁶

It is devastating to witness a child, having fully recovered from a critical illness which has required prolonged endotracheal intubation, die from complications of a long term tracheotomy necessitated by an iatrogenic subglottic stenosis.

The prevailing attitude of the otolaryngologist is still a "wait and see" policy based on two premises. First, that the laryngotracheal complex increases in size as the patient grows and that the patient eventually will outgrow the problem; second, that extensive surgery on the larynx of the infant will interfere with normal growth and thus produce a mini-larynx.

The first premise, if it were true, disregards the potential dangers of the pediatric patient needing for a lengthy

From the Departments of Otolaryngology of the Hospital for Sick Children and the University of Toronto.

Assisted financially by a grant from the Medical Research Council of Canada.

period of time a tracheotomy to bypass a subglottic stenosis. The hazardous existence of these children has not been emphasized previously. Follow-up of 25 consecutive patients with severe subglottic stenosis requiring a tracheotomy for more than six months as seen in an eight year period at the Hospital for Sick Children, shows 14 were successfully extubated, six died of causes directly attributable to the tracheotomy; and five had not been decannulated (Table I).

TABLE I
SEVERE SUBGLOTTIC STENOSIS
FOLLOW-UP OF
25 CONSECUTIVE CASES

14	Extubated	56%
6	Died	24%
5	Still have tracheotomy	20%
25		

It should be emphasized that despite the most meticulous attention paid to tracheotomy care and despite the fact that the tracheotomies had been present for a minimum of nine months, 6 of the 25 (or 24%) died during this "wait and see" period. The mean time of extubation was three years following tracheotomy. Disregarding the financial aspect of the situation, such a high mortality rate makes the "wait and see" policy unacceptable.

With regard to the second premise, experimental data collected from work done on growing monkeys in the past three years strongly indicates that extensive operative procedures in the growing larynx do not interfere with growth potentials.

It can be argued that a surgical procedure to correct subglottic stenosis with a mortality rate less than 25% and a success rate of 75% would be an advance. Criteria of success would be the achievement of a good airway and a satisfactory voice, while allowing normal laryngeal development. This should be achieved over a period of time con-

TABLE II
AIMS OF SURGICAL CORRECTION

1. Mortality less than 25%
2. Success rate more than 75%
 - good airway
 - normal voice
 - normal laryngeal development
3. Time factor considerably less than three years

siderably less than three years (Table II).

EXPERIMENTAL DATA

The feasibility of operative correction of subglottic stenosis in 16 monkeys has been published.⁷ Since then five additional monkeys, equal in size to a newborn infant, have been operated on as controls by transecting the cricoid cartilage anteriorly. The results obtained when these animals were sacrificed six to twelve months later showed that instead of retaining its ring-like configuration, the cricoid has grown into a "U" like structure. Obviously without the dense fibrous reaction of a subglottic stenosis, the elasticity of the growing infant cartilage allows the incised ends to spring apart with the gap anteriorly filling in with soft tissue so that the cricoid lumen is enlarged considerably.

However, this result does not pertain to the cricoid in subglottic stenosis, consequently the incised ends must be held apart. This may be accomplished by the use of an autogenous cartilage graft. A logical choice is a part of the adjacent thyroid cartilage, either pedicled or free. It has been shown experimentally in monkeys that the lower one-third of the thyroid alae is not necessary for the normal function and development of the larynx. We believe that in subglottic stenosis in children it is only necessary to make an incision through the cricoid cartilage and stenosis and interpose a graft without removing scar tissue and without internal surfacing or stenting. This achieves an adequate cricoid lumen.

Last year we reached the point in our experimental surgery in which we were

satisfied that the technique devised and used in the monkeys could be applied safely to selected patients. To test the applicability in the human situation, we chose two of our severest cases, neither of whom could be dilated further than number 12 French.

We are encouraged by the success of these two patients and our case selection will be somewhat less rigid.

CASE REPORTS

Case 1. The first patient operated on using the approach described above was a five-year-old girl referred to us from another center. She had been intubated at birth because of respiratory distress.

After six weeks of intubation she had to have a tracheotomy because of an acquired subglottic stenosis. Laryngeal dilations were performed periodically without achieving any improvement. Our first examination by microlaryngoscopy showed a marked dense stenotic area in the subglottic space. A potential lumen could be seen posteriorly in the subglottic space. A number 10 French Jackson laryngeal dilator could be passed only with considerable resistance. It was impossible to pass a dilator larger than a number 12 French. Since it was obvious that conventional treatment was accomplishing nothing, our surgical procedure was decided upon. The larynx was exposed and an incision made through the cricoid and the first two tracheal rings. The fibrosis extended superiorly to the vocal cords, actually involving the right side, and inferiorly to the third tracheal ring. The extent of the fibrosis precluded the use of a rotation flap. Consequently it was necessary to obtain a free graft from the lower one-third of the thyroid cartilage leaving a buttress bilaterally to avoid damage to the recurrent laryngeal nerve. This piece of cartilage was inserted vertically between the cut ends of the cricoid and first tracheal ring. The graft was fixed in position with

6-0 Prolene suture. The soft tissues and skin were closed and a dressing applied. The larynx and trachea were then examined with the child still under anesthesia with a 6 mm Holinger bronchoscope. The postoperative course was quite uneventful although we left the tracheotomy tube in place.

Two months later microlaryngoscopy showed the subglottic lumen to have narrowed to a number 22 French but dilated readily to a number 28 French, permitting the passage again of a 6 mm bronchoscope.

The procedure was repeated recently (seven months after the surgery) with a lesser degree of narrowing. In the meantime the patient has been wearing a number 1 Holinger tracheotomy tube and carrying on normally at home in another city. In the past four months, the tracheotomy tube has been blocked most of the time and we hope after the next examination under anesthesia, the tracheotomy tube can be eliminated.

Case 2. A three-year-old girl sustained a severe head injury. Following five days of intubation a tracheotomy was performed. Six months later she was referred to the otolaryngology service from an outside hospital as the attending physicians had been unable to extubate the patient.

Direct laryngoscopy and bronchoscopy revealed a stenosis in the subglottis and upper 2 cms of the trachea which admitted a number 8 dilator. Over a period of some weeks, repeated dilations increased this to number 12 French but no further increase in size was possible.

The surgical procedure as outlined in Case 1 was performed postoperatively over three months ago. She has maintained a lumen that admits a number 26 French dilator and allows a 4 mm bronchoscope to pass with ease. Extubation is planned in the near future.

REFERENCES

1. Fearon B, Cotton R: Surgical correction of subglottic stenosis of the larynx. *Ann Otol Rhinol Laryngol* 81:508-513, 1972
2. Turner AL: Stenosis of the larynx in children following intubation and tracheotomy: *J Laryngol Otol* 31:313, 1916
3. Downs JJ, Striker TW, Stool S: Complications of nasotracheal intubation in children. Letters to Editor, *New Eng J Med* 274:226, 1966
4. Fearon B, Ellis D: The management of long term airway problems in infants and children. *Ann Otol Rhinol Laryngol* 80:669-677, 1971
5. Fearon B, MacDonald RE, Smith C, et al: Airway problems in children following prolonged endotracheal intubation. *Ann Otol Rhinol Laryngol* 75:975-986, 1966
6. McGovern FH, FitzHugh GS, Edgemon LJ: The hazards of endotracheal intubation. *Ann Otol Rhinol Laryngol* 80:556-564, 1971
7. Fearon B, Cotton R: Subglottic stenosis in infants and children: the clinical problem and experimental surgical correction. *Can J Oto: 1-281*, 1972

MULTIPLE POSTINTUBATION COMPLICATIONS

MARSHALL STROME, M.D.

CHARLES F. FERGUSON, M.D.

BOSTON, MASSACHUSETTS

SUMMARY — Four cases of multiple postintubation laryngotracheal injuries are presented. They encompass a range of injury including isolated soft tissue damage to total necrosis of the cricotracheal cartilages. The specific precursors were identified and retrospective pitfalls in management outlined. These included difficult intubation, an oversized endotracheal tube, a prolonged duration of intubation, reintubation, and debilitation. Three basic stages of injury were found upon which a treatment regimen was founded: 1) edema alone; 2) infected mucosa alone or with involvement of the internal perichondrium; and 3) true chondritis with or without necrosis. A rational, conservative management protocol based on these histopathological and clinical correlates was formulated.

Many procedures are available today for the management of laryngotracheal injuries. Tracheal resection and the use of T-tubes are currently at center stage. Silastic and dacron implants may have merit. Laryngo-tracheal reconstruction using bladder mucosa in animal experimentation would seem to hold great promise. Even prolonged intubation, challenging established concepts, is being reconsidered in some institutions.

Yet, within this spectrum of innovative surgical techniques the role of the time-honored conservative approaches, particularly in childhood, cannot be overlooked. Principles applicable to the fully developed laryngotrachea may not prove applicable for the developing organ. In spite of great surgical advances for laryngotracheal injuries in adults, little carry-over regarding similar childhood injury has been reported in the literature. Four cases are presented with multiple injuries illustrating that in selected instances in a childhood population, a blend of conservative management and direct intervention can have considerable merit. In the most extensive injuries, direct surgical intervention will be required.

Detailing our current rationale and indications for the management of choice in the multiply injured larynx and trachea is the format of this presentation. The unique manifestations of each case will be discussed at the conclusion of the particular presentation. A broad overview depicting fundamental essential concepts gleaned from these cases will be put into proper perspective.

CASE REPORTS

Case 1. The first case is that of a nine-year-old child admitted to another medical institution for open heart surgery. Nasotracheal intubation was effected for the first three postoperative days. Information was not available as to the tube size or as to how the tube was tolerated. On extubation a very hoarse voice was noted. Four and one-half weeks following extubation, an upper respiratory tract infection preceded an episode of severe stridor. Direct laryngoscopy was reported as revealing only an anterior glottic adhesion.

The child was transferred to the Children's Hospital Medical Center where laryngoscopy revealed a web between

From the Children's Hospital Medical Center, Beth Israel Hospital, Boston, Massachusetts.

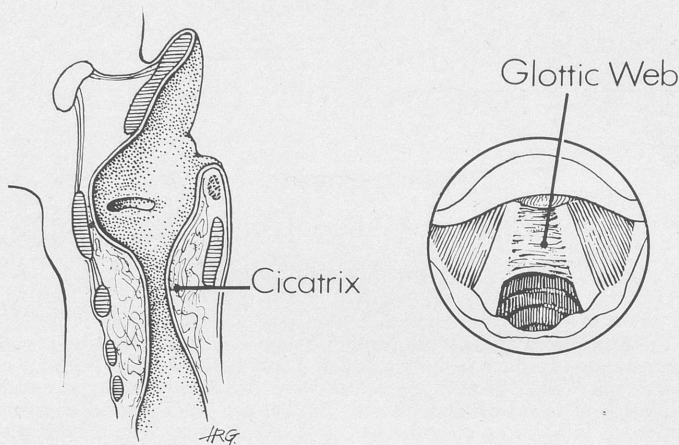


Fig. 1. Anterior glottic web and soft tissue stenosis are illustrated as they presented endoscopically.

the anterior two thirds of the vocal cords. The web was separated using endoscopic techniques. Bronchoscopy then revealed a previously undescribed stenotic lesion extending from the subglottic area to the third tracheal ring (Fig. 1). A low tracheotomy was performed and dilatation initiated. Four subsequent dilatations without adjunctive measures effected extubation four months following the tracheotomy. A five year follow-up has revealed no further airway problems.

Comment. Unless a suspicion of multiple injuries exists and a complete endoscopic and radiologic examination performed, the multiply injured laryngotrachea will not be immediately identified. Endolaryngeal microsurgical techniques available today, combined with dilatation, are successful with membranous subglottic and glottic lesions, particularly in children. Conservative management whenever possible, but especially in childhood, remains our preferred method of management. The adjunctive judicious use of intralesional steroids can significantly reduce the number of operative procedures required. Open surgical procedures for isolated soft tissue laryngotracheal lesions, risking infection with further cicatrix formation, are to be avoided

particularly in infancy and childhood where potential growth considerations assume such import.

Case 2. The second case is that of an 11-year-old boy admitted in February of 1973 with lethargy and progressive dyspnea. A large undifferentiated sarcoma of the right chest was diagnosed. Intubation for a lymphangiogram, iliac crest and submandibular node biopsies were effected with a 6.5 French Portex* tube. The intubation was described as difficult. The procedure lasted five and one-half hours. Immediate extubation was unsuccessful and the Portex tube was replaced for an additional 24 hours. Following extubation, respiration was marginal for the next 48 hours and the patient was essentially aphonic. Steroids, steam, and vaponephrin were employed with minimal improvement. Three thousand rads in conjunction with chemotherapy were to be administered over the ensuing three weeks prior to surgical extirpation of the chest lesion. Eight days following the initiation of this program, the child experienced progressive dyspnea, fever, and was found to have a white blood cell count of 700. The Otolaryngology Service was consulted at this time and granulomatous changes of both cords and subglottic region were visualized on in-

* Portex, a division of Smiths Industries, Inc., Wilmington, Maine.

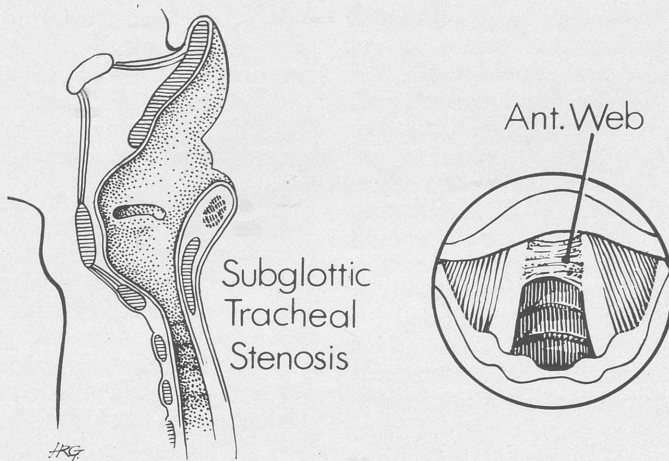


Fig. 2. Ten days after medical therapy, endoscopy revealed an anterior glottic web with a decreased subglottic lumen as illustrated.

direct examination. Antibiotics, steam and steroids were advised. The patient was endoscoped when his general condition permitted. Endoscopy revealed glottic, subglottic, and upper tracheal granulations obliterating most of the airway. A tracheotomy was advised and this was the mode of administration of anesthesia for the chest exploration. A culture taken at the time of the endoscopic procedure was negative. Postoperatively, the granulations significantly decreased on a continuous medical regimen along with markedly improved respiration. Hoping to prevent cordal and subglottic adhesions, the tracheostomy tube was removed on the fifth postoperative day. The patient continued to improve until the eleventh postoperative day when there was a sudden episode of respiratory distress. The tracheostomy tube was reinserted and endoscopy revealed a necrotic subglottic mass almost totally obstructing the subglottic space. Removal of this mass revealed necrotic posterior cricoid cartilage which lay exposed. A culture of the specimen grew *Pseudomonas*. Appropriate medical therapy was instituted and ten days later endoscopy revealed an anterior glottic web with a decreased subglottic lumen (Fig. 2). Steroids were injected. Because of the necessity for continuous chemotherapy, complicated by significantly depressed

white counts and cachexia, it was impossible to pursue a planned series of dilatations. Five dilatations were performed over the following year in conjunction with medical management. The granulations and laryngeal web have resolved but the subglottic stenosis persists with only a 3 - 4 mm lumen. Definitive treatment must await the outcome of chemotherapy.

Comment. A difficult intubation was compounded by the utilization of a tube too large for the patient. Immediate extubation was not possible and the reintubation, as is most often the case, proved to be hazardous. Whenever extubation is not feasible, immediate endoscopic evaluation should be performed. Acute injuries of serious import following short-term intubation have been described.¹ It has also been established by this report and others² that the most serious injuries of the laryngo-trachea follow reintubation without proper diagnostic measures. Tracheotomy is better advised in these instances.

Radiation and chemotherapeutic depression of the white blood cell count probably enabled further progression of the infectious process in the laryngo-trachea. It is interesting that at the first endoscopic procedure the culture was

negative. If tissue had been submitted for culture, perhaps the true bacterial nature of the infection could have been determined a few days earlier. All future cases will have biopsy samples submitted for culture. In addition, patients requiring continuous chemotherapy with the potential of developing sudden significant neutropenia should not be subjected to open surgical restorative procedures until such time as chemotherapy can be discontinued for at least a six-month period. To do otherwise in the face of potential neutropenia would be to risk almost certain infection and failure.

Clearly, extubation as has recently been suggested to prevent cordal fusion, failed in this instance. In infectious granulomatous laryngotracheitis, early extubation is probably not warranted.

Conservative techniques can effect resolution of membranous lesions in the face of more significant associated lesions, thus decreasing surgical intervention. The cordal component in this instance was managed by the conservative approach making surgical consideration at a future date necessary only for the subglottic region.

Case 3. The third case is that of an eight and one-half-year-old boy admitted for correction of an anomalous pulmonary venous return and atrial septal defect. In the 24-hour postoperative interval, three cardiac arrests required vigorous resuscitative measures. During this time the nasotracheal tube size was increased to No. 6 French and the patient maintained on a respirator for the next five days. Extubation could not be effected at that time and a tracheotomy was performed. Endoscopy revealed a necrotic tissue mass in the subglottic region as well as circumferential subglottic granulations extending into the upper trachea. Tissue samples and cultures revealed a pseudomonas chondritis. Subsequent endoscopies revealed the entire cricoid to be involved. Appropriate antibiotics and steroids were instituted. Upon arrest of the infectious process a funnel-shaped subglottic le-

sion which lacked external support was seen endoscopically. Dilatations were unsuccessful and a thyrotracheotomy with stenting and grafting was performed. Additional procedures to provide external support will be required.

Comment. Again, an inappropriately sized tube, maintained for too long a duration in a debilitated patient led to profound injury of the laryngotrachea. When events such as vigorous resuscitative efforts increase the probability of an acute laryngotracheal injury, tracheotomy should be considered early in the postoperative period. This is particularly true in an anoxic patient when consideration is given to increasing the tube size in order to attain proper flow rates.

With a significant circumferential loss of, or injury to cartilage, dilatation alone will not suffice. When given a total cricoid slough, it is a futile gesture. When there is cartilaginous loss, stenting alone will have little success. Open exploration and surgical assessment is essential. Total removal of the involved segment and anastomosis and/or some form of augmentation will be required.

Case 4. The fourth case is that of a 22-year-old woman with infectious hepatitis initially intubated while comatose. A red rubber tube, oversized for her larynx, had been in place three days when a trial extubation failed. The replacement tube was Portex. On the fifth day of intubation extubation again failed and otolaryngology consultation was requested. During the intubation interval a staphylococcus tracheitis was diagnosed from the tracheal aspirates. The patient was on a respirator during this interval and tolerated it poorly.

A tracheotomy, laryngoscopy, and bronchoscopy were performed. Clinically, a total chondritis of the trachea to just above the carina was suspected. Culture and histologic sections of the tracheal wall confirmed pseudomonas tracheitis and laryngitis. In the postoperative period a No. 5 fenestrated tube was placed and occlusion of the tube was not possible. Speech was buccal only. Tomograms revealed fusion

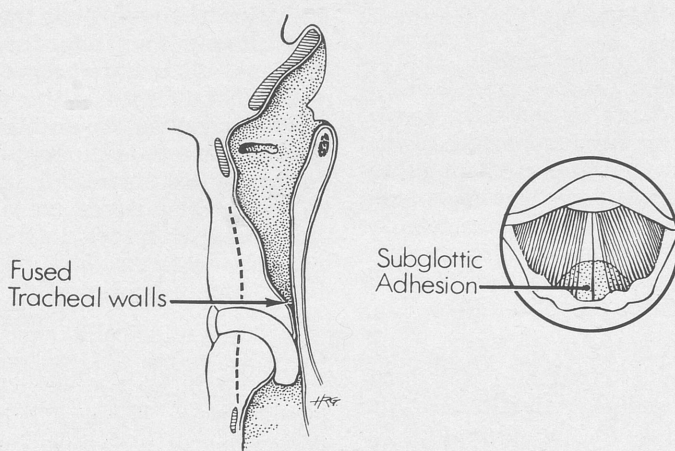


Fig. 3. Illustrated are the fused tracheal walls, subglottic stenosis and intra-arytenoid web as they presented clinically.

of the anterior and posterior tracheal walls above the tracheotomy. For medical reasons eight months were allowed to elapse before reconstructive operative procedures were initiated. The initial cricothyrotomy revealed an interarytenoid web, a 3 mm subglottic stenosis, and the fused tracheal wall as mentioned above (Fig. 3). In addition, tracheomalacia was present to within 1 cm of the carina. Only the subglottic and tracheal stenoses were managed at the first procedure. A subglottic cicatrix which included most of the right cord was removed. This area was grafted with split thickness skin, a stent inserted, and sternohyoid muscle interposed into the anterior defect. The successful first stage resulted in a competent glottic and subglottic region. Six months later a resection of the fused trachea was performed. A relatively poor anterior tracheal wall distally and a less than optimal cricoid anastomotic site yielded only a 7 mm airway. A tracheotomy was not performed in the relatively avascular trachea. Subsequently, suture granulomas developed at the site of the anastomosis and necessitated repeat tracheotomy six months postresection. Thus, the final operative procedure was required. Via a midline laryngotracheal fissure suture granulomas were removed and covered with

split thickness skin. A septal cartilage mucosal autograft was interposed in the incision line and stented for six weeks. The patient currently has adequate laryngeal speech, and an 8 mm laryngotracheal lumen at the narrowest segment.

Comment. This most extensive of the pseudomonas chondritides presented was not amenable to conservative measures. Surgery is the only modality that can be employed in such cases. In this instance, the larynx was approached first, inasmuch as the fused trachea distally prevented contamination from the tracheotomy site. At subsequent tracheal resection, the poor quality of the distal tracheal segment and cricoid anastomotic site made success questionable from the onset. Adjunctive chest surgery would have added little as the malacia extended to within 1 cm of the carina. Suture granulomas around nonabsorbable sutures have been a nagging problem, in our hands, with tracheal resections and, but for stay sutures, absorbable material will be used in the future. Open removal of all the sutures and the attendant granulations with anterior placement of a mucosal and cartilaginous autograft ultimately was successful in restoring a serviceable laryngotracheal conduit.

DISCUSSION

Four cases of postintubation laryngo-tracheal injuries, ranging from isolated soft tissue damage to extensive loss of cartilage, have been reported. From this a conservative management protocol, including soft tissue as well as more extensive supportive structures can be formulated. Any such format must assess the magnitude of the injury in relationship to the age of the injured.

Five factors noted in the case presentations, when assessed as isolated entities or as multiples, should alert the astute clinician to the potential for severe intubation complications:

1) a difficult intubation; 2) a relatively large tube for a given larynx and trachea; 3) duration of intubation; 4) reintubation; and 5) debilitation.

In the normal case, short-term intubations have been shown to cause mucosal damage as well as more extensive acute injury.¹ A difficult intubation only increases the likelihood of the aforementioned. If dyspnea follows extubation in such an instance, the extent of the injury must be assessed endoscopically before instituting therapeutic measures or considering other diagnostic contingencies.

The oversized endotracheal tube is an established precursor for subsequent mucosal injury. The tube size in a given situation must not be correlated with age alone. The surgeon must insist on a clinical anatomical correlation if the number of extubation injuries is to decrease. In all three severely injured laryngotracheas discussed, an oversized tube was a direct precursor.

Reintubation in a potential laryngo-tracheal injury is the fait accompli. It insures significant progressive injury. When primary extubation fails, an accurate assessment of the type and magnitude of the injury must be established. A therapeutic regimen is predicated upon this assessment.

In the debilitated, early consideration of a tracheotomy is essential. Hypoxia,

radiation therapy, poor perfusion, and neutropenia encourage secondary infections of major proportion in intubated patients. In the normal case, determination of the duration of intubation requires assessment of many factors including age, tolerance of the tube *per se*, use of respirators, concurrent infections, etc. However, in the debilitated patient, an intubation interval longer than 48 hours is unsound.

Histopathologically and clinically, there are three basic stages of injury requiring management. The first is edema alone. The next is infected mucosa alone or with involvement of the internal perichondrium. The last is true chondritis with or without necrosis.

Soft tissue injuries present with dyspnea, either acute in onset or delayed, as in the first case presented. As a generality, soft tissue injuries respond to conservative methods in all age groups. Following short-term intubation mucosal subglottic edema is most often etiologic, particularly in childhood. Steam, racemic epinephrine, and steroids are often therapeutic. More extensive acute injuries such as arytenoid dislocation, pseudomembrane formation, and hematomas can frequently be managed endoscopically with adjunctive medical support. Tracheotomy is reserved for the more extreme circumstances. Delayed soft tissue injury, when cartilage is not involved, will respond to conservative measures as reported in the first case. This is particularly true in childhood when potential growth will insure a subsequently adequate airway. Anterior and posterior glottic webs and membranous subglottic and tracheal stenoses can be managed with a combination of endoscopic techniques including incision, dilatation, and/or local steroid injections. Tracheotomy must precede the former in most instances.

Mucosal abrasion and/or lacerations with subsequent short-term infection leads to membranous stenosis. In the debilitated, or in the prolonged intubation with the aforementioned injury, the

infectious process can extend to cartilaginous structures. In the extubation failure with endoscopic evidence of infected granulations, tracheotomy should be performed, if possible below the level of infection. Biopsies of the granulation tissue are taken and submitted for culture as well. A small segment of cartilage from the tracheotomy site is submitted for histological evidence of chondritis. Inspiratory collapse of the anterior tracheal wall should be sought for initially and on subsequent evaluation. Then, in granulomatous laryngotracheitis, further manipulation is not pursued at the first endoscopic evaluation. Internal stenting at the initial endoscopy invites disaster. Dilatations are not advised at this time. Humidification and appropriate antibiotics are instituted. Systemic steroids, although controversial, are used in our management. In five to ten days, depending on the magnitude of the granulations, repeat endoscopy is performed. When most of the mucous membrane surface demonstrates healing, dilatations are instituted if necessary. For small persistent granulomas, steroid injection followed by endoscopic removal is performed. Injection prior to removal facilitates the injection. If at this examination, particularly in the child, malacia compromising greater than 50% of the airway is discovered, internal

stenting utilizing Birck's technique³ is instituted. Antibiotics and steroids are maintained throughout this time interval.

If a bacterial chondritis is detected at either the first or second endoscopic procedure, a commitment is made for three to six weeks of intravenous antibiotics. If the internal and external perichondrium are involved, six weeks is essential to assure complete cartilaginous healing. With partial chondritis subsequent malacia can be anticipated. When mucous membrane healing is 80-90% complete, a small internal stent as previously mentioned is worthy of a trial. Particularly in childhood with attendant significant fibrosis, a stent placed internally for a six week to three month duration can lead to a very satisfactory airway. When there is evidence of total bacterial inflammation of the cartilage of the laryngotracheal region, with necrosis, open surgical restoration is to be anticipated. Medical management must be maintained for a minimum of six weeks to insure complete healing prior to surgical intervention. During this time interval, associated amenable injuries as in Case 2 can be handled conservatively with excellent results. Dilatation and/or internal stenting without adjunctive external surgical procedures will have little effect in an area of cartilaginous necrosis.

CHILDREN'S HOSPITAL MEDICAL CENTER, BETH ISRAEL HOSPITAL, BOSTON, MASSACHUSETTS

REFERENCES

1. Komorn RM, Smith CP, Erwin JR: Acute laryngeal injury with short-term endotracheal anaesthesia. *Laryngoscope*. 83:683-690, 1973
2. Hilding AC: Laryngotracheal damage during intratracheal anaesthesia. *Ann Otol Rhinol Laryngol* 80:565-581, 1971
3. Birck HG: Laryngeal stenosis. *Am Acad Ophth & Otol* 74:140-143, 1970

DISCUSSION OF PRECEDING PAPERS

PAUL H. HOLINGER, M.D. (Chicago, Illinois): I want to thank the essayists of these papers because of the extreme importance and interest in this problem. A few endoscopic pictures show our recent experience with the laryngeal and the laryngeal-tracheal injuries. These simply add to this discussion of problems which we are all experiencing at the present time.

(Slide) This is a conventional picture of in-

jury of the posterior commissure with the pedunculated granulomas. (Slide) We see fusion of the anterior commissure and two-thirds of the membranous portions of the cords with the opening in which the tube itself was situated. (Slide) Here we see fusion of the entire larynx and in addition a prominent posterior commissure synechia with an adhesion of the arytenoids which increases in proportion to the duration of the intubation. (Slide)

Here the fusion between the arytenoids is evident with fusion of the cords themselves.

And, to continue, (Slide) a synechia between the arytenoids immediately anterior to the posterior commissure with small openings anterior and posterior to the synechia. Finally, (Slide) the most complete obliteration of the normal structures of the larynx we have ever seen.

Again I want to compliment the authors on the papers they presented. This is a tragic problem that we are all facing with increasing frequency. Its severity is documented by these endoscopic photographs.

JOHN A. KIRCHNER, M.D. (New Haven, Connecticut): I think Dr. Fearon and Dr. Strome have brought us a report here on something that is becoming more common and certainly more difficult to treat.

I think they are to be congratulated on their aggressive approach to these things because that is really the only thing that works.

There is a line in Shakespeare that says, "Diseases desperate grown, by desperate appliance are relieved, or not at all!" and I think these cases certainly illustrate this.

I would like to ask one question of Dr. Fearon: It seems to me if I understood you correctly that this cartilage that you wedged into the gap in the cricoid has no lining. I hope

I understood you correctly, but I have used a piece of hyoid occasionally to wedge into the cricoid and in two cases that I have used this, I have lost it both times. I was wondering if you have an epithelial lining inside this cricoid cartilage insert.

ROBIN COTTON, M.D. (Author's response): Dr. Kirchner, it is a free graft cartilage with perichondrium on both sides and it is of such a size (we were only talking about infants and children) that even though on the experimental model it has always been pedicled on muscle, in the two clinical cases we have done, we have found that the graft is better.

It is of such a size that the free graft is perfectly satisfactory.

Certain sizes of cartilage retain enough blood supply for survival. The piece of cartilage we are using is small enough for that purpose.

I think leaving the perichondrium on the inner surface also makes it easier for the mucosa from the subglottic region to grow over without this great buildup of granulation tissue.

I would also like to add that we feel that internal stenting is the factor which gave rise to the problem in the first place. If you can avoid internal stenting as we have done, I think this is of significant help.

FIBROSARCOMA OF THE HEAD AND NECK: A CLINICAL ANALYSIS OF FORTY CASES

RONNIE E. SWAIN, M.D.

DONALD G. SESSIONS, M.D.

JOSEPH H. OGURA, M.D.

ST. LOUIS, MISSOURI

SUMMARY—This paper is a clinical analysis of 40 patients with fibrosarcoma of the head and neck treated at the Washington University Medical School, St. Louis, Missouri. Follow-up ranged from 6 to 25 years in 31 patients. Treatment consisted of widefield surgical excision, surgery and irradiation, narrowfield surgery, and irradiation alone. Histological classification of the tumors correlates well with the prognosis. In the well differentiated tumor group 12 out of 16 patients treated for a cure were free of tumor. In the poorly differentiated group only one out of five treated for a cure was free of tumor. Widefield surgical excision is the treatment of choice. Prophylactic radical neck dissection is not indicated. Narrowfield surgical excision resulted in a high recurrence rate although the salvage rate was excellent with subsequent widefield resection. Irradiation therapy produced good palliative results in those patients treated by irradiation alone and has a definite role in the management of this disease.

This paper is an evaluation of 40 patients with fibrosarcoma of the head and neck treated at Washington University Medical School in St. Louis, Missouri, from 1940-1972. These cases were obtained from the pathology records at Barnes Hospital and were reviewed previously by senior members of the Department of Pathology at the Washington University Medical School. Two cases diagnosed as neurogenic fibrosarcoma and two cases diagnosed as dermatofibrosarcoma protuberans were included in this series as well differentiated fibrosarcoma. All patient records were carefully examined and follow-up was obtained from the tumor registry and by patient or family contact.

RESULTS

The age and sex incidence in this series of patients was similar to that reported by other authors.¹⁻⁴ There were 20 patients under 40 years of age and 11 of these were less than nine years of

age. Twenty-two patients were male and 18 were female.

Anatomically the tumors were found in numerous sites, but the soft tissues of the face and neck were most frequently encountered (Table I). Six patients presented clinically with masses fixed to the mandible. Histologically the most likely origin of these tumors was the periosteum or connective tissue overlying the bone.

A mass was the most common presenting symptom although several patients complained of pain and symptoms

TABLE I
SITES OF ORIGIN

Face	13	Nasopharynx	2
Neck	9	Larynx	1
Mandible	6	Oral Cavity	1
Maxillary Sinus	4	Nasal Cavity	1
Scalp	3		

From the Department of Otolaryngology, Washington University School of Medicine, St. Louis, Missouri.

Supported by National Institutes of Health Grant 5 T01 NS0 5190.

related to cranial nerve paralysis. Most of the masses were superficially palpable but some were deeply situated. One patient with a tumor of the true vocal cord presented with hoarseness (Table II).

TABLE II
SYMPTOMS

Superficial Mass	17
Deep Mass	12
Mass and Pain	7
Mass and Cranial Nerve	3
Hoarseness	1

Histologically the fibrosarcomas were divided into two groups based upon the microscopic descriptions. Twenty-eight tumors were considered well differentiated and 12 were considered poorly differentiated. This classification was often difficult because of the gradation of changes occurring between well differentiated and poorly differentiated lesions. In this series tumors originally described as moderately well differentiated were placed in the well differentiated group.

Nine patients were either lost to follow-up or were followed less than four years. Therefore, 31 were suitable for evaluation of the results of treatment. Follow-up ranged from 6 to 25 years and all but two patients were followed for over 10 years. Twenty-two of these tumors were well differentiated and 9 were poorly differentiated.

These patients were treated by a combination of methods and could be classified into five groups: 1) widefield surgical excision, 2) surgery and irradiation,

3) excisional biopsy or narrowfield surgery, 4) irradiation alone, and 5) no treatment. Widefield excision was performed in nine patients in an attempt to achieve extensive surgical margins and two of them died. Four patients were treated with the combination of surgery and irradiation. The adequacy of the surgical margins was questionable in these patients and postoperative irradiation was given. Three of the patients died. Eight patients had narrowfield excisional biopsies and all had recurrences, but five of them were free of tumor following widefield surgery. Three patients with very large tumors were considered inoperable or refused surgery. They were treated palliatively with full course irradiation via external beam or radon seeds. All of these patients died. Seven patients received no therapy and were only biopsied. All of these died of their disease.

In Tables III and IV the results of treatment are summarized according to tumor differentiation. The results are more meaningful if the patients receiving irradiation and no treatment are excluded and only those treated for a cure are considered. In the well differentiated tumor group 16 patients were treated for a cure. Twelve (75%) were free of tumor at least six years after treatment. In the poorly differentiated group five patients were treated for cure and one (20%) was tumor free at least six years after treatment. The six-year-free status for all patients in the well differentiated group, regardless of the method of management, was 12/22 or 55%. In the poorly differentiated group 1/9 or 11% were free of tumor after six years.

TABLE III
SIX YEAR STATUS OF WELL DIFFERENTIATED TUMORS

	Widefield Surgery	Surgery + Irradiation	*Narrowfield Surgery	Irradiation	No Treatment
Dead	1	1	2	3	3
Tumor Free	6	1	5	0	0
Total	7	2	7	3	3

* All tumors recurred and were treated with widefield surgery.

TABLE IV
SIX YEAR STATUS OF POORLY DIFFERENTIATED TUMORS

	Widefield Surgery	Surgery + Irradiation	*Narrowfield Surgery	Irradiation	No Treatment
Dead	1	2	1	0	4
Tumor Free	1	0	0	0	0
Total	2	2	1	0	4

* All tumors recurred and were treated with widefield surgery.

The average time of recurrence post treatment was 1.9 years. The latest recurrences in the series were discovered in two patients in the fifth year post treatment.

DISCUSSION

The problems involved in diagnosing fibrosarcoma have been well described in the literature. The tumor is difficult to differentiate from cicatrix, fibroma, pseudosarcomatous fasciitis, desmoids, fibromatosis, and fibroma.^{1,4-7} Terminology such as spindle cell sarcoma, neurogenic sarcoma, dermatofibrosarcoma protuberans, and fibroxanthosarcoma have also added to the confusion. Stout attempted to differentiate these entities.⁴ His concept of fibrosarcoma as a malignant tumor of fibroblasts and his classification of well differentiated low grade and poorly differentiated high grade lesions makes it easier to understand the confusing terminology. The tumors were considered well differentiated if there was relatively little hyperchromatism or atypism, uniformity in size and shape of the cells, and a paucity of mitoses. The collagen and reticulum fibers were interwoven between the cells creating a lace-like pattern. The tumors were considered poorly differentiated if there was a marked variability in cell size and shape, a large number of mitoses associated with bizarre forms and a paucity of reticulum and collagen fibers separating the cells. In this series the clinical findings and prognosis seem to correlate well with this classification.

Dermatofibrosarcoma protuberans presents as a subcutaneous nodule or nodules and some pathologists do not

classify it in the same category with fibrosarcomas located in deep connective tissue.^{2,6} Histologically the cells have a well differentiated appearance, and it is indistinguishable from well differentiated fibrosarcoma of another site. It often extends invasively in thickened plaques far beyond the grossly visible nodule.⁴ Recurrences are common when only a narrowfield resection is performed, and when improperly treated, it will kill the patient.⁴ Metastases to lung and lymph node, although rare, have been reported.^{4,8,9} In this series one patient had ten excisions over a 20-year-period and is now alive and tumor free 12 years after extensive widefield resection. The other patient who also had several recurrences is now alive and tumor free eight years after widefield resection.

The etiology of fibrosarcoma is unknown. Since it is considered a tumor of fibroblasts, a basic component of scar tissue, the relationship of tumor to trauma must be considered. This relationship is controversial and most series have only an occasional case in which physical trauma could be definitely implicated. There was only one patient in this series who had a history of trauma to the site of tumor and who fulfilled Ewing's criteria postulating trauma and tumor as cause and effect.¹⁰

Another factor often implicated is irradiation therapy. This has been well described in the literature, and it is generally accepted that fibrosarcoma can arise in irradiated tissue.¹¹⁻¹² Lacassagne and Burrows working independently demonstrated that fibrosarcoma can be produced in legs of rabbits exposed to roentgenray radiation. However, both

TABLE V
SYMPTOMS OF WELL DIFFERENTIATED TUMORS

	<i>Mass and Cranial Nerve</i>	<i>Deep Mass</i>	<i>Pain</i>	<i>Superficial Mass</i>
Tumor free 6 yr	0	2	0	10
Dead of disease	2	5	3	0
Total	2	7	3	10

investigators found that chronic non-specific inflammation at the site of exposure was also a necessary factor.^{13,14}

Four patients in this series had a definite history of irradiation therapy at the site where well differentiated fibrosarcoma later developed. The latency period varied from six to 20 years. These cases were reported earlier and have been described in detail by Petit, Chamness, and Ackerman.¹¹ In each case excessive or poorly planned irradiation had been applied to the site of occurrence.

Most of the well differentiated tumors presented as superficial masses and the tumor free rates were highest in this group. Patients presenting with poorly differentiated lesions were more likely to have a deep mass, cranial nerve signs or pain. A patient presenting with these symptoms had less chance of survival than one with a superficially palpable mass. Thus the site of tumor, degree of differentiation, and symptomatology were closely correlated with survival (Tables V and VI).

Most authors feel the primary mode of therapy should be widefield surgical excision.^{6,11} Our results substantiate the efficacy of this method of treatment. Six out of seven of the well differentiated tumors treated with widefield surgical excision alone were tumor free six years postsurgery. The only patient with a

poorly differentiated tumor to remain free of disease was treated with widefield surgical excision.

Excisional biopsy or narrowfield resection has no place in the curative treatment of this malignancy. Eight patients in our series were treated in this manner and all had recurrences. However, five of these were salvaged following widefield resection.

Traditionally fibrosarcoma, as well as other soft tissue sarcomas, have been regarded as radioresistant. However, the exact role of irradiation therapy in the treatment of this disease is difficult to evaluate since in most cases it has been used for palliation or in conjunction with surgery. Windeyer et al reviewed 59 patients on whom irradiation was used in the treatment of fibrosarcoma of soft tissues.¹⁵ Four out of 11 treated for a cure with radiotherapy alone were free of disease after five years. Eleven surgical failures were also treated for a cure and six were tumor free after five years. When palliation was the principal object of treatment, good results were noted in 11 of 14 patients.

In this series only three patients were treated with full course radiotherapy alone and all died of their disease. However, these tumors were very large, and the treatment was considered palliative. The response to irradiation was good and marked diminution in the size of

TABLE VI
SYMPTOMS OF POORLY DIFFERENTIATED TUMORS

	<i>Mass and Cranial Nerve</i>	<i>Deep Mass</i>	<i>Pain</i>	<i>Superficial Mass</i>
Tumor free 6 yr	0	1	0	0
Dead of disease	1	3	4	0
Total	1	4	4	0

the lesions was noted in two patients. In one patient the mass disappeared completely only to recur four years later. The fact that only one out of four survived when treated with combined surgery and radiotherapy is also indicative of the advanced nature of their disease.

Several isolated reports have appeared in the literature concerning palliation with chemotherapy.^{6,16} All of these are difficult to interpret because of the numerous agents used, many of which were combined with irradiation. Wiltshaw¹⁶ reported seven patients with fibrosarcoma treated with Methotrexate^{®*} and remission or transient regression was noted in five of them. However, some of these patients had irradiation treatment prior to the chemotherapy making interpretation difficult. One patient had a dramatic response to chlorambucil, Methotrexate,[®] and actinomycin D.¹⁶ Hays et al⁶ reported good response to dactinomycin in two patients. However, these patients also received irradiation. None of the patients in our series received chemotherapy.

Most authors agree that patients who die of fibrosarcoma have a post treatment course characterized by recurrences although metastasis does occur often in this disease.¹ Conley and Stout reported an 18% incidence of hematogenous metastasis to lung, abdominal cavity and bone.³ Bizer reported an 11% incidence of lymph node metastasis.² Heller et al felt that death was usually due to hematogenous metastasis although he described several cases with regional node involvement.¹

In this series metastasis was noted clinically or pathologically in eight cases (25%). The primary tumor masses were deeply situated and six were poorly differentiated. Two patients manifested lymph node metastasis in addition to hematogenous spread, and

lung and bone were the most common metastatic site. In general, because of the paucity of lymph node metastases, we feel that prophylactic radical neck dissection is not indicated in the treatment of this disease. Occasionally in a patient presenting with a deep neck mass, a neck dissection may be necessary in order to achieve a widefield resection.

The length of survival after tumor recurrence was highly variable and related to cell differentiation as well as to the site of the primary. Some patients had a rapid demise following their recurrences and palliative therapy was of little benefit except in controlling pain. Three patients, however, lived for over four years with evidence of viable tumor. According to Wiltshaw, two patients have been described in the literature as surviving 15 years after the metastasis first appeared.¹⁶ It would seem, therefore, the head and neck surgeon should be very aggressive in managing the individual patient. Palliative effort with partial resection, irradiation, chemotherapy, and cryotherapy can be very rewarding in certain patients.

CONCLUSIONS

1. Classification of the fibrosarcoma histologically according to cell differentiation correlates well with prognosis.
2. The only known factor strongly implicated in the etiology is irradiation.
3. Distant metastasis occurs frequently in the poorly differentiated tumors.
4. Widefield surgical resection is the treatment of choice.
5. Prophylactic radical neck dissection is not indicated because of the paucity of lymph node metastasis.
6. Irradiation therapy is a good method of palliative management.

* Lederle Laboratories, Pearl River, New York.

7. Patients presenting with a deep mass, pain, or cranial nerve signs have a poor prognosis.

8. Recurrences should be treated aggressively even when widefield surgical excision is no longer feasible.

WASHINGTON UNIVERSITY SCHOOL OF MEDICINE, ST. LOUIS, MO.

Ronnie E. Swain, M.D. is presently located at the Dept. of Otolaryngology and Maxillo-facial Surgery, Naval Regional Medical Center, Oakland, California 94627.

ACKNOWLEDGMENT—The authors wish to thank M. P. Fryer, M.D. for allowing us to include his patients and the patients of his diseased associates, J. B. Brown, M.D. and L. Byers, M.D. in this study.

REFERENCES

1. Heller EL, Sieber WK: Fibrosarcoma: A clinical and pathologic study of sixty cases. *Surgery* 27:539-545, 1950
2. Bizer LS: Fibrosarcoma: Report of sixty-four cases. *Am J Surg* 121:586-587, 1971
3. Conley J, Stout AP, Healy WV: Clinico-pathologic analysis of eighty-four patients with an original diagnosis of fibrosarcoma of the head and neck. *Am J Surg* 114:564-569, 1967
4. Stout AP: Fibrosarcoma: The malignant tumor of fibroblasts. *Cancer* 1:30-58, 1948
5. Stout AP: Fibrosarcoma in infants and children. *Cancer* 15:1028-1040, 1962
6. Hays DM, Mirabal VQ, Karlan MS, et al: Fibrosarcoma in infants and children. *J Pediatr Surg* 5:176-183, 1970
7. MacKenzie DH: Fibroma: A dangerous diagnosis. A review of 205 cases of fibrosarcoma of soft tissues. *Br J Surg* 51:607, 1964
8. Adams JT, Saltzstein SL: Metastasizing dermatofibrosarcoma protuberans. Report of two cases. *Am Surg* 29:878-886, 1963
9. Bonnabeau EC: Dermatofibrosarcoma protuberans. *W Va Med J* 69:107-111, 1973
10. Ewing J: Relation of trauma to malignant tumors. *Am J Surg* 40:30, 1926
11. Pettit VD, Chamness JT, Ackerman LV: Fibromatosis and fibrosarcoma following irradiation therapy. *Cancer* 7:149-158, 1954
12. Schwartz EE, Rothstein JD: Fibrosarcoma following radiation therapy. *J Am Med Assoc* 203:296-298, 1968
13. Burrows H, Mayneard WV, Roberts JE: Neoplasia following the application of x-rays to inflammatory lesions. *Proc R Soc Lond (Biol)* 123:213-217, 1937
14. Lacassagne A, Vinzent R: Sarcomes provoques chez des lapins par l'irradiation d'abces a streptobacillus cavial. *Compt. rend, Soc de Biol* 100:249-251, 1929
15. Windeyer B, Dische S, Mansfield CM: The place of radiotherapy in the management of fibrosarcoma of the soft tissue. *Clin Radiol* 17:32, 1966
16. Wiltshaw E: Methotrexate® in treatment of sarcomata. *Br Med J* 2:142-145, 1967

DISCUSSION

CHARLES M. NORRIS, M.D. (Philadelphia, Pa.): This has been a fine review and beautiful summary of the subject. Fibrosarcomas of the larynx are quite uncommon, as we know, and I would like to show just a few illustrations of cases we have had at Jackson Clinic.

Could I have the first slide, please? (Slide) This was a 63-year-old female and this is the smallest lesion of this type we have seen. It looked initially like a benign polyp. (Slide) But the pathologist showed us this was a fibrosarcoma removed as you saw by a simple cordectomy. (Slide) This is a 65-year-old male who had a rather nondescript thickening of the right vocal cord as seen on direct laryngoscopy. (Slide) Another fibrosarcoma, rather well differentiated. This one was treated by the fronto-lateral technique of partial laryngectomy. (Slide) And, this is the surgical specimen. (Slide) This was a physician, Chief of Obstetrics and Gynecology at one of our

suburban hospitals. His lesion was somewhat more infiltrative and laryngectomy seemed to be the wisest and safest plan of treatment. He developed an excellent esophageal voice.

These first three patients remain well eight to sixteen years with no evidence of recurrence. (Slide) Then, this final one was a failure. She was a 14-year-old girl with a less well differentiated fibrosarcoma. Partial laryngectomy was initial form of treatment with recurrence after nine months; then laryngectomy, and although she developed no local recurrence over a period of two years and nine months, she did develop hematogenous spread to lungs and pleura and died of this rather than local recurrence.

We found no lymph node metastasis in any of these four cases which confirms Dr. Swain's observation that regional lymph node metastasis is uncommon in association with fibrosarcoma in this area.

PANEL

VOICE REHABILITATION FOLLOWING LARYNGECTOMY

STANLEY TAUB, M.D., New York, New York

ROBERT M. KOMORN, M.D., Houston, Texas

WILLIAM W. MONTGOMERY, M.D., Boston, Massachusetts

ALDEN H. MILLER, M.D., Los Angeles, California

MODERATOR

JOHN J. CONLEY, M.D., New York, New York

INTRODUCTION

JOHN J. CONLEY, M.D.

Our subject is quite an interesting one, one that alludes to a strong desire, particularly for the laryngologist, but as strong as that desire has been, the answer has been equally illusive. So we are sort of at the points of these two horns, a great desire of overcoming the handicap of losing the human voice and again the extreme technical difficulties in trying to master this situation.

I think it was Dr. Sessions the other day who showed in the earliest slides of von Langenbeck's work in 1874, a hundred years ago, that one of the doctors in his clinic made a speaking device which is not too different from some of the speaking devices which are being made today, a hundred years later. Then, I think there was a hiatus up until about 1916 when Dr. Chiarri who was at the University of Vienna, modified some of Dr. Glutz's work and tried to do reconstructive work about the larynx.

I think the most significant contribution to this work has been done by a doctor by the name of Briani in northern Italy (Verona). Not many people have ever heard of Briani, but I can tell you that he published on this in the 1950's before anyone in this country or any other country was doing any significant work.

I have some slides of Dr. Briani and I think we ought to establish him as the "father" of this work.

(Slide) Here is the fistula, right at the anterior part of the neck. He puts a trochar in the mouth, comes down and perforates it and this again is his fistula or tunnel. He made it extremely simple in the beginning.

He then became a little bit more elaborate and he advanced from the fistula concept to the tunnel concept and here he is manufacturing the tunnel — a nice little tube, isn't it? (Slide) And, he has it fashioned in exactly the right way.

I must say that when I was interested in this, I was not aware of Dr. Briani's work, but in reviewing the literature, having thought I had discovered a new operation, I found that he had already published on this, so I wrote to him in Verona in order to communicate with him but I was sorry to find that he had died. But here is your tunnel, Dr. Briani. (Slide) Now, here is his speaking device. He had a trap tube and here is a patient wearing it.

I am sure our panel will be able to tell us some of the difficulties they have encountered and obviously some of the

difficulties that Briani encountered at that time.

So, in the past ten years, we have had a proliferation of perforators, tunnelers, approximators, reconstructors and a few auto- and homotransplanters. They have gathered together various pressure valves and speaking devices and saliva traps and air shunt mechanisms and have been trying to overcome the basic problem.

It seems that really the big problem here is aspiration and I do not think anyone has solved the aspiration problem completely. This brings in the absence of the cords, the absence of the epiglottis and the surgeon who can manufacture a new epiglottis, "auto-epiglottis," and some new muscular

mechanism which will respond by sphincteric contraction through the swallowing process will probably overcome this.

It would seem that the ultimate result perhaps will come from the use of local tissue, the use of some of the strap muscles, some of the cartilages, some of the bones, some of the nerves, some of the composite flaps in the area of the neck and gullet itself. That however has not surfaced.

In the meantime we have some splendid examples of the progress and the ingenious application of ideas with respect to tolerance and perforations and voice production and prevention of aspiration by members of our panel.

AIR BYPASS VOICE PROSTHESIS FOR VOCAL REHABILITATION OF LARYNGECTOMEES

STANLEY TAUB, M.D.

NEW YORK, NEW YORK

SUMMARY — An air bypass voice prosthesis and the refinement of a surgical technique has been developed. It involves a one-stage, low retrograde cervical esophagostomy that is functionally and cosmetically feasible since it permits hidden use of the device, while eliminating fistula tract stenosis and aspiration. Most importantly, it provides a natural speech mechanism without any training period. Patients can regain immediate speech following installation of a voice prosthesis with a minimum of maintenance required. Ultimately, they have demonstrated greater self-reliance and developed a high degree of self-esteem which has enabled them to resume a normal way of life.

The loss of speech after a laryngectomy procedure constitutes a severe functional and social impairment that is not easily overcome. Existing electronic speech appliances have not achieved the desired goal of providing a natural, trouble-free source of speech. Recent surgical techniques have not eliminated the distressing problems of aspiration and fistula tract stenosis.

A voice prosthesis used in combination with a surgical technique has been developed that provides for immediate vocal rehabilitation of laryngectomees. This technique has several unique features: The surgical procedure is single-stage; finger control of speech is practically eliminated; problems of aspiration and fistula tract stenosis are virtually nonexistent; and the procedure restores effortless speech without any training.

The successful use of the prosthesis is dependent upon the creation of a cervical esophageal fistula placed above the clavicle anterolaterally in the lower third of the neck. The skin fistula is directed retrograde and enters the esophagus approximately 3 cm above the level of the tracheostome in a downward direction, thereby minimizing re-

flux salivary secretions in the tracheostomal area.

Surgical Technique. A longitudinal incision paralleling the lower anterior border of the sternocleidomastoid muscle is carried deeply between the sternal and clavicular heads into the retroesophageal space. This incision is preferably made in the left side of the neck unless a radical neck dissection was performed on that side. With the aid of a previously inserted Foley catheter the esophagus is exposed anteriorly and laterally. An opening is made into the lumen of the esophagus, wide enough to admit the tip of the fifth finger. The opening should be made approximately 2 to 3 cm above the level of the tracheostoma. If the opening is made below this point, there is a chance that the air will not flow freely upward but be forced into the stomach.

The sternal head of the sternocleidomastoid muscle is severed and rotated over the carotid vessels for added bulk and protection, and sutured with 3-0 chromic catgut to the prevertebral fascia and to the periesophageal tissue, posterior to the margins of the fistula.

A superiorly based skin flap (includ-

ing platysma) is then raised from the lateral side of the original incision and sutured to the circumference of the esophageal opening with the skin surface inwards. The flap is approximately 9 cm in length and 7 cm in width.

The tubulation of the skin flap is facilitated by inserting the beveled tip of a No. 26 Bardex nasopharyngeal airway into the esophagus in the downward direction.

The tubing of the flap is carried for a distance of 4 to 5 cm, after which the skin of the medial edge of the longitudinal neck incision is drawn over the raw surface of the tubed flap and sutured to the skin edge of the inverted flap.

The donor flap defect in the lower neck is closed by local approximation of tissues and is facilitated by flexing the neck at the time of skin closure. Small dog ears may have to be excised from the upper and lower poles of the skin incision. 4-0 nylon sutures are used to close the skin.

Suction drainage was used postoperatively to minimize fluid and blood collection and is removed on the third postoperative day. The No. 26 Bardex tube is secured in the fistula by wearing a neck band made out of ½ inch gauze attached to a rubber plug inserted into the flanged opening of the rubber tube.

During the first three postoperative days, the patients are fed by gravity drainage through a No. 18 gauge nasogastric tube inserted through the Bardex nasopharyngeal airway tube into the stomach. On the fourth postoperative day, patients may begin oral feeding. If subcutaneous leakage of salivary secretions and oral feedings occur through the suture line, the nasogastric tube feedings should be resumed through the fistula tube until the leakage subsides. Antibiotics should be administered throughout the entire postoperative period. Sutures are removed from the eighth to tenth postoperative days. The Bardex tube should not be removed

before three weeks when the prosthesis is installed.

Description of the Voice Prosthesis.

The voice prosthesis was designed for the purpose of allowing the laryngectomy to breathe, talk, and eat without having to remove or adjust the device. Made out of light plastic materials, the air bypass mechanism is supported on the upper part of the chest by rubber connections to laryngectomy and fistula tubes. In halation and exhalation occur through the air bypass valve from a breathing port on its undersurface. During phonation, a natural increase in breath pressure activates the bypass valve, allowing air to flow into the esophagus via the fistula valve and fistula tube. The flow of air over the esophageal mucosa in the area of the cricopharyngeus muscle provides a sound source that is articulated as speech. Once the device is properly fitted, the patient begins to speak immediately.

Breathing and speaking do not require finger control. However, an initial adjustment of the manual turn valve is necessary to achieve proper balance between the two functions during routine use. The bypass valve can be opened for greater air exchange as may be required during increased physical activity.

Criteria for Selection. Laryngectomees are selected for this procedure on the basis of the following criteria: No evidence of recurrent cancer; no evidence of pharyngeal or esophageal stricture on clinical and barium swallow examination; minimal exposure to radiation therapy; and positive psychological motivation. They were rejected if they had a previous bilateral radical neck operation because of inadequate protection to the carotid vessels. Operation was deferred if the skin in the proposed area of the fistula was indurated, inflamed, or markedly injected, or if there was evidence of radiation skin damage.

Air-blowing Test. This test has re-

cently been developed to accurately locate the position of the inner esophago-stomal opening. Its purpose is to determine whether or not a patient will have a successful speech result, prior to introduction of surgery. This test is primarily for nonesophageal speakers.

Preoperatively, a No. 18 Foley rubber catheter is passed transnasally into the upper esophagus to a point approximately 2 to 3 cm above the level of the tracheostome, below the cricopharyngeus muscle. By blowing air through the tube, one should be able to hear a sound produced in the esophagus transmitted into the pharynx.

The tip of the Foley catheter can be palpated through the skin, and this point should be marked with Gentian violet, prior to operation. It is essential to mark the exact spot. A slight correction might be necessary if the opening in the catheter is proximal to the tip.

As the sound is produced, the patient can be asked to articulate. If a whisper-type speech is heard, most likely the catheter has been pulled above the cricopharyngeus into the hypopharynx. It therefore is essential that the opening be made below the cricopharyngeus. If there is a tight cricopharyngeus or a stricture present, no air will pass upwards around the tube, and the normal flow of air necessary for easy sound production will not occur. In these instances it will be forced into the stomach.

Installation of the Device. With practice the patient can install the voice prosthesis in less than five minutes, and it can be worn continuously for 12 to 18 hours daily.

Installation of Fistula Tube. It is important to maintain fluid-tight systems in the fistula, otherwise leakage will occur that can be a source of great annoyance to the laryngectomee, particularly during swallowing.

The fistula tube employs the use of an inner flange worn inside the esophagus. The tube is not to be inserted until after the third postoperative week after

satisfactory wound-healing. As the flanged portion of the fistula tube enters the esophagus, it opens. The high intra-esophageal pressures exerted during swallowing force the rubber flange against the mucosa, thereby preventing leakage around the tube into the neck area.

An external fistula valve must be used with the inner flanged tube in order to prevent reflux of secretion from entering the tube lumen and contaminating the prosthesis.

The device is easily concealed behind a shirt and tie or laryngectomy scarf.

Speech Production. There is no training required for speech production. Once the voice prosthesis is properly installed, the laryngectomee can begin to speak immediately. However, there is usually a short adjustment period required for accommodation to the device, its installation, and its use.

Speech Results. A recent research study by Eric D. Blom, Ph.D. was designed to compare acoustical and perceptual features of six superior esophageal speakers with six untrained patients using the air bypass voice prosthesis.¹ The speech of both groups was judged as to intelligibility and listener acceptability. None of the speakers using the air bypass mechanism was able to learn esophageal speech. The obvious conclusion is that speakers using the air bypass voice prosthesis are as intelligible as highly trained esophageal speakers, although no training is required.

Usage. Of the 26 patients operated on, 13 are currently using the device. Nine had their fistulas closed and four patients expired. Of those who expired, two had terminal cancer not related to the use of the device. A third patient who had a history of orthovoltage radiation 25 years ago, died of complications following carotid hemorrhage eight months postoperatively. In a fourth patient who had a history of curative radiation in 1961, carotid hemorrhage occurred on the fifteenth

postoperative day, following extensive slough of the skin fistula tube.

Fistulas were closed in four patients because of uncontrollable leakage; in two patients because of tracheostomal irritation; in one patient because of lack of interest; and in two patients because of poor sound transmission. Since the use of the inner flange tube, no fistulas have been closed because of salivary leakage.

In those patients currently using the prosthesis who had been preoperatively irradiated and had no subsequent postoperative wound-healing complications,

cobalt teletherapy, 60 had been the most common type used, delivering 6,000 to 6,500 rads over a period of six to seven weeks.

In view of the problem that we encountered in the two patients previously described, we suggest that this technique not be used in patients who have been irradiated preoperatively above 3,000 rads, although some consider 4,500 rads within the safe limit.

There are now 393 patient months of the use of the air bypass method. The average age of these patients is 59 years.

4 E. 78TH ST., NEW YORK, N.Y. 10021.

REFERENCE

1. Blom ED: *A Comparative Investigation of Acoustical and Perceptual Features of Esophageal Speech and Speech with the Taub Prosthesis*, dissertation, University of Maryland, 1972

VOCAL REHABILITATION IN THE LARYNGECTOMIZED PATIENT WITH A TRACHEOESOPHAGEAL SHUNT

ROBERT M. KOMORN, M.D.

HOUSTON, TEXAS

SUMMARY — A tracheoesophageal shunt was used for vocal rehabilitation in 29 laryngectomized patients. Twenty-three patients had the shunt constructed at the time of laryngectomy. Radiation therapy or radical neck dissection did not limit the usefulness of the shunt. Twenty of the 29 patients acquired useful speech (69%). T-E shunt speech equals or exceeds other forms of alaryngeal speech when measured against the parameters of rate, duration, and intelligence. Failure to acquire useful speech occurred in nine patients because of either stenosis of the shunt (10%), aspiration (7%), or wound problems (14%). Stenosis of the shunt was primarily a problem in patients who received postoperative radiation therapy without a stent in the shunt. Wound problems were related to either our previous use of a lateral based flap or diabetes mellitus. Since January 1973 there has only been one failure in fourteen shunts constructed. The technique as now used is simple, applicable in a wide variety of clinical situations and associated with a low incidence of complications.

Any surgeon who has had to remove a larynx in a vigorous, energetic patient and then sees that patient become depressed, despondent, and withdrawn because of lack of speech, understands the need for rapid vocal rehabilitation. Providing this vocal rehabilitation by a surgical procedure which reconnects the pulmonary air supply to the hypopharynx in a manner that duplicates the vocal function of the larynx has intrigued and tantalized generations of surgeons.¹⁻⁷ In order for any surgical vocal rehabilitation technique to be considered successful, it must satisfy several important requirements. Technically, the connection must be easy to construct, preferably in one stage, applicable in a wide variety of clinical conditions, not contraindicated by radiation therapy, and relatively permanent in that stenosis or plugging of the connection by keratin debris is not a major problem. Physiologically, aspiration of any clinical significance should not occur, and the speech produced should equal or exceed the speech produced by

nonsurgical methods. The procedure, obviously, must also work in the majority of patients and it must also be relatively safe in that if it does fail or complications develop, there is no significant increase in morbidity or mortality.

After almost three years' experience with a tracheoesophageal shunt, we feel that this technique meets most of these requirements. The tracheoesophageal shunt is a modern day improvement on the diathermy needle tracheo-hypopharyngeal fistula technique described by Guttman in 1935.² It was reintroduced in its present form by Calcaterra and Jafek.⁸

SURGICAL TECHNIQUE

The shunt is constructed from a full thickness, inferiorly based, esophageal mucosal flap that is developed either at the time of laryngectomy or as a one-staged procedure subsequent to laryngectomy if nonsurgical vocal rehabilitation has not been achieved. There have

From the Department of Otorhinolaryngology and Communicative Sciences, Baylor College of Medicine and the Veterans Administration Hospital, Houston, Texas.

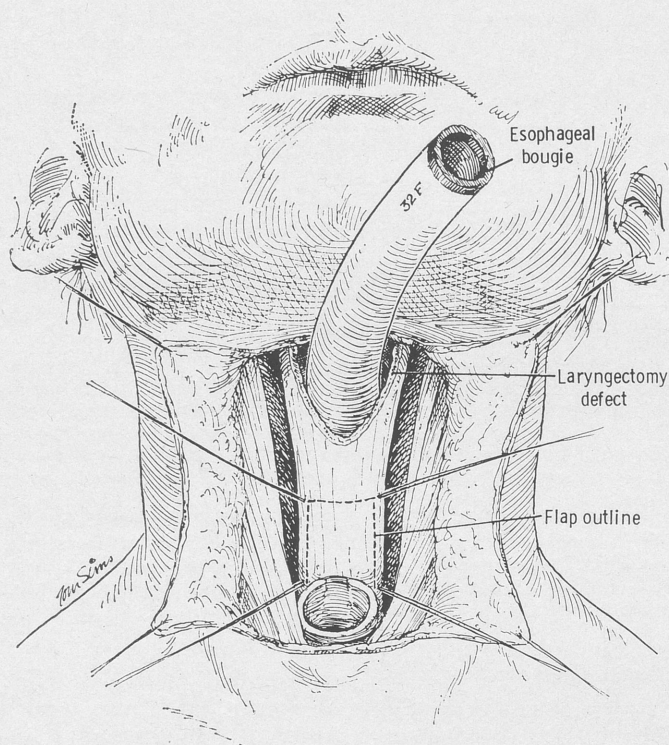


Fig. 1. Methylene blue and silk stay sutures outlining a $2\frac{1}{2} \times 5$ cm full thickness inferior based esophageal flap. A bougie inserted either through the mouth or through the hypopharyngeal defect present at the time of laryngectomy stabilizes the esophagus.

been several minor changes in the technique since our previous reports.^{7,8}

We now begin construction of the shunt by outlining and stabilizing the esophagus with a 32 or 34 F esophageal bougie. A flap, measuring $2\frac{1}{2} \times 5$ cm, based inferiorly and placed in the center of the anterior wall of the esophagus, is outlined with stay sutures and methylene blue dye (Fig. 1). This flap design was used in 26 of the patients. An oblique flap was used in three patients but is no longer recommended. Placing the flap high in the cervical esophagus but not compromising the final inferior position of the shunt in respect to the trachea, appears to result in better speech. When the shunt is constructed as part of the laryngectomy procedure, a 2 cm margin is maintained between the superior edge of the flap and the hypopharyngeal defect.

After the flap is cut, a tracheal meatus for the shunt is formed from a $1\frac{1}{2}$ cm horizontal incision in the middle of the posterior wall of the trachea. The incision is placed 2 cm below the distal end of the trachea. A single layer of submucosal interrupted 3-0 dexton sutures is used to accurately approximate the mucosa of the flap to the tracheal mucosa (Fig. 2). Before completing this end-to-side anastomosis, a 12 or 14 F catheter is inserted through the tracheal meatus and directed into the esophagus. The flap is then tubed around this catheter by using a continuous 3-0 dexton suture that begins at the superior end of the esophageal defect and runs up to the flap-trachea anastomosis (Fig. 3). The bougie is left in the esophagus during closure to help maintain the esophageal lumen and permit more precise mucosal approximation. A second layer of 4-0 silk is used to re-

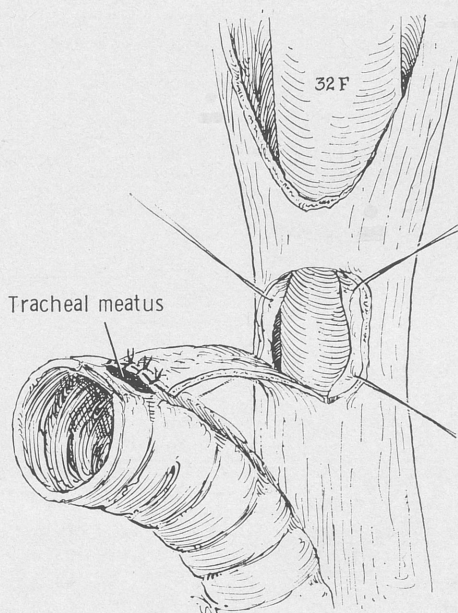


Fig. 2. Approximation of the flap to the posterior wall of the trachea with a single layer of interrupted sutures. The incision for the tracheal meatus of the shunt is horizontal, measures $1\frac{1}{2}$ cm and is placed approximately 2 cm below the distal end of the trachea.

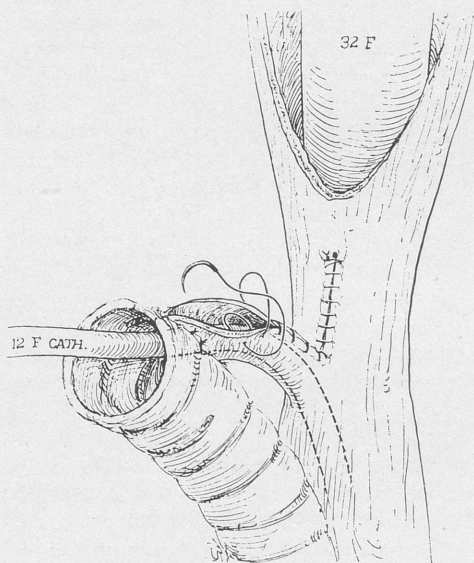


Fig. 3. After the flap to trachea anastomosis is completed, a catheter is placed through the meatus into the esophagus and the flap tubed around this catheter. A continuous Connell suture is used to close both the esophageal defect and tube the flap.

inforce this closure (Fig. 4). After 10-18 days, or when healing is complete and there is no crusting or raw surface around the shunt meatus, the indwelling stent is removed and speech training is begun.

CLINICAL MATERIAL AND INDICATIONS

Since 1971, this technique has been used 30 times in 29 male patients between the ages of 42 and 69. One patient had a second shunt constructed 28 months after the first shunt stenosed while he was receiving planned postoperative radiation therapy. The main indication for the procedure was that the patient either required a total laryngectomy, with or without a radical neck dissection, or was not vocally rehabilitated after a previous laryngectomy. Twenty-three shunts were constructed at the time of laryngectomy, and seven were constructed 4 to 77 months after laryngectomy. Four patients had a widefield laryngectomy and 25 patients had an ipsilateral radical neck dissection with the laryngectomy. There were no bilateral radical neck dissections in this group. Radiation therapy with a minimum dose of 5000 rads was used in four patients preoperatively and in nine patients postoperatively. Postoperative radiation was begun 2-4 weeks after surgery and is part of our approach to the management of advanced laryngeal cancer. The fields included the area of the shunt in one preoperative and all nine of the postoperative patients. We did not construct a shunt in any patient where a laryngectomy was done solely for palliation of advanced disease. We also had a firm requirement that the patients understood and accepted the risk of this new procedure. Diabetes, cardiovascular or pulmonary disease, if controlled medically, were not initially considered to be limitations.

RESULTS

Twenty-four of twenty-nine patients (83%) spoke 8-44 days after the shunt was constructed, but only 20 patients (69%) have retained shunt speech. The patient who had the second shunt constructed after the first one stenosed is

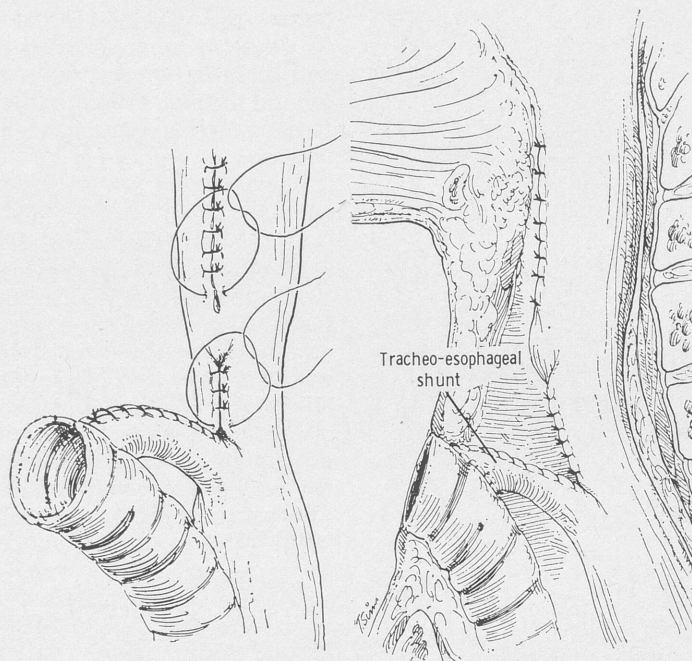


Fig. 4. A second layer of interrupted silk sutures reinforces the continuous suture closure. The hypopharyngeal defect is closed after the shunt is completed (left). Appearance of the completed shunt showing its inferior position in relation to the meatus in the trachea (right).

only counted once in these results because it is too soon postsurgery to analyze the outcome of the second procedure. Speech is produced by having the patient cover the tracheal stoma while exhaling.[†]

Speech quality depends on many variables including education levels, previous dialectic patterns, and the profi-

ciency of coordinating stoma coverage with expiration. All our patients benefited from instruction and practice sessions with a speech pathologist. When measured against the parameters of duration, rate and intelligibility, T-E shunt speech equals or surpasses other forms of vocal rehabilitation (Table I).⁹ Mean duration of sustained /a/ and counting with one breath surpasses asai¹⁰ and

TABLE I
COMPARISON OF T-E SHUNT SPEECH

	<i>T-E Shunt</i>	<i>Asai*</i>	<i>Esophageal</i>	<i>Air Bypass</i>
Mean Sustained /a/	7.20 sec (N = 8)	7.34 sec (N = 5)	2.37 sec + (N = 30)	—
Mean Counting/Breath	34 (N = 8)	17 (N = 5)	8 * (N = 7)	—
Mean Rate (WPM)	133 (N = 8)	133 (N = 5)	117 ++ (N = 5)	141 ** (N = 6)

* Adapted from Snidecor (1969)

+ Adapted from Berlin (1969)

++ Adapted from Snidecor (1955)

** Adapted from Blom (1972)

[†] Brief movie illustrating T-E shunt speech was presented at this point.

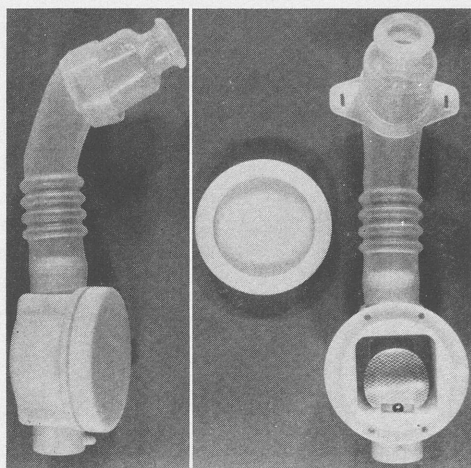


Fig. 5. Modified air bypass device with a silastic tracheal connector (left). Adjustable valve mechanism that closes with rapid or forced expiration permitting the air to enter the hypopharynx via the T-E shunt.

esophageal speech.¹¹ The rate is essentially equal for T-E shunt,asai¹¹ and air bypass (voicebak) speech.¹² All these methods have a better rate than esophageal speech.¹³

The median score for intelligibility as tested by the Black and Haagen Multiple Choice Intelligibility Test was 82% in eight shunt speakers.⁹ Six of the eight scored above 75% and three of these six were above 90%.⁹ Blom¹² has reported intelligibility scores of 90% for air bypass (voicebak) speakers. Excellent esophageal speakers usually score between 60-80%.¹⁴

Recently we have tried to overcome the disadvantage of the patient's having to use one hand to talk by modifying the air bypass* device for T-E shunt use. Theoretically, the valve mechanism would be activated by rapid expiration and the air forced back into the shunt in the same manner that occurs when the trachea is covered with a thumb or forefinger (Fig. 5). It has not received wide acceptance by our patients. The main drawbacks are that it causes tracheal irritation, is difficult to seal in the

trachea, and the patients are reluctant to switch to a device when they can so readily produce speech with their thumb or forefinger.

DISCUSSION

Stenosis or aspiration have not been major problems in our experience with the T-E shunt. Stenosis, where the shunt becomes completely occluded and non-functional, occurred in one of 17 patients who received no radiation, none of four patients who received preoperative radiation, and in the first two of eight patients who received postoperative radiation. Since we began using an indwelling catheter during postoperative radiation two years ago, the remaining six patients in this group have not had stenosis.

Relative stenosis has occasionally occurred in our patients. By this, we mean either difficulty in initiating speech if the shunt has not been used for several hours, or the necessity to strain or use excessive force to initiate speech. This problem was frequently overcome by having the patients occasionally dilate the shunt with a catheter or sleep with the catheter in place for several additional weeks or until the shunt stabilized. Two patients appeared to be developing a stricture at the tracheal meatus of the shunt, but surgical revision of the meatus corrected this problem. It is important to be aware of this problem of relative stenosis in the immediate postoperative period. Close follow-up of the patients and aggressive use of dilatation or revision of the meatus will prevent permanent stenosis and results in better speech.

Aspiration does not occur with solid foods, but did appear with liquids in 14 patients. In six patients it was asymptomatic and only presented as a small drop of moisture at the meatus of the shunt. In eight patients, five of whom had a documented hiatus hernia, it was symptomatic in that it either was esthetically annoying or caused coughing. Cinefluoroscopic studies suggest that

* La Barge, Inc., St. Louis, Mo.

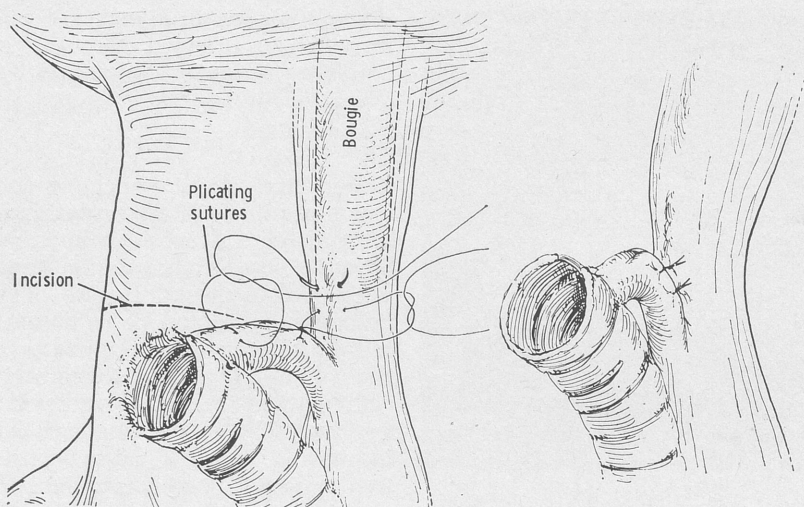


Fig. 6. Plicating nylon sutures (2-3) used to narrow the lumen of the shunt and shift the shunt upward and backward. The esophageal bougie is reinserted during the revision (left). Completed revision showing the changed angle of the now narrowed T-E shunt (right).

this is a reflex phenomenon and not direct entrance of fluid into the shunt.⁷ All eight of the symptomatic patients had the shunt revised. The revision is accomplished under local anesthesia. The shunt is tightened with several plicating sutures of interrupted 3-0 nylon and shifted upward and backward by anchoring these sutures in fibrous tissue near the esophagus (Fig. 6). Six of the eight patients had elimination of the aspiration by this technique. In the two patients that had persistent symptomatic aspiration after revision, the shunt was closed at their request by simply oversewing the meatus under local anesthesia in the office. Useful speech was present for several weeks in one of these patients and for over a year in the other. In no instance, even in the two patients who had their shunt closed, has the asymptomatic or symptomatic aspiration caused weight loss, tracheitis, pneumonia or pulmonary complications. It is also interesting to note that aspiration tends to decrease with time. Careful observation in the immediate postsurgical period will help determine which shunts should be revised.

Wound infection, cicatrix formation, and stenosis of both the trachea stoma

and shunt meatus occurred in two of 26 patients who had the shunt constructed from a medial based flap. Both patients had diabetes mellitus. One also had significant arteriosclerosis and required a carotid endarterectomy and bilateral aorto-femoral bypasses two months after the shunt was constructed. Both of these patients had beginning speech but lost it when the scarring became significant enough that dilatation or revision surgery was not practical.

The only major complications or wound problems occurred in the three patients with a shunt constructed from the lateral based flap. One patient was free of problems but the other two had wound breakdown and fistula formation. Even though the shunt stenosed and the fistula closed spontaneously in both of these latter two patients, one of them had a severe esophageal stricture and died one year later of bronchopneumonia and rupture of a right lower lobe abscess. The other patient healed without an esophageal stricture and now uses excellent esophageal speech.

Two other patients in our series have died. Both had myocardial infarctions and no evidence of cancer or aspiration

at the time of their deaths. Their shunts were working.

CONCLUSIONS

Our results have convinced us that the medial based tracheoesophageal shunt is a successful surgical technique for vocal rehabilitation. It satisfies the technical requirements of being an easy, one-stage procedure that can be used in a wide variety of clinical situations. Radiation therapy or radical neck dissections are not contraindications to its use. Stenosis only occurred in three of the patients, and since we began stenting the shunt during radiation therapy, have eliminated the cause for stenosis in two of the three patients.

The laterally based flap was originally conceived as a means of preventing reflux aspiration. It has failed, causing major wound problems in two of three patients. Aspiration, if it occurs in a symptomatic fashion, can best be corrected by revising the medially based

shunt. The presence of a hiatus hernia increases the change for symptomatic aspiration but we are unwilling to call this a definite contraindication. Our major wound problems have been limited to either the laterally based flap or in patients with diabetes and/or arteriosclerosis. We no longer recommend or use the laterally based flap and even though only two of our patients had diabetes, the occurrence of wound problems in both of these two patients make us feel that diabetes may be a contraindication. Again, it must be stressed that careful and close follow-up in the immediate postoperative period must be done. Relative stenosis or aspiration can be effectively managed, and both problems usually resolve as the shunt matures or after revision surgery if revision is necessary. Overall, twenty patients (69%) have been successfully rehabilitated, and we have had only one stenosis and no major wound problems in the fourteen patients who had a shunt constructed since January 1973.

7800 FANNIN ST., HOUSTON, TEXAS 77025.

REFERENCES

1. Gussenbauer C: Über die uste durch. Th. Billroth an menschen ausgeführte kehlkopf-erstirpation, und die anwendung eines kunstlichen kehlkopfes. Verh dtsch Ges Chir p. 250, 1874
2. Guttman MR: Tracheo-hypopharyngeal fistulization. Trans Am Laryngol Rhinol and Otol Society 41:219-226, 1935
3. Conley JJ, DeArnesti F, Pierce MK: A new surgical technique for the vocal rehabilitation of the laryngectomized patient. Ann Otol Rhinol Laryngol 67:644-655, 1958
4. Assai R: Laryngoplasty. J Japan Broncho-Esophagological Soc 12:1-3, 1960
5. Montgomery WW, Toohill RJ: Voice rehabilitation after laryngectomy. Arch Otolaryngol 88:499-505, 1968
6. Calcaterra TC, Jafek BW: Tracheoesophageal shunt for speech rehabilitation after total laryngectomy. Arch Otolaryngol 94:124-128, 1971
7. Komorn RM, Weycer JS, Sessions RB, et al: Vocal rehabilitation with a tracheoesophageal shunt. Arch Otolaryngol 97:303-305, 1973
8. Komorn RM: Surgical technique for vocal rehabilitation. *Neoplasia of Head and Neck*, Chicago, Illinois, Year Book Medical Publishers, Inc. (in press)
9. Malone P, Komorn RM: Speech rehabilitation following laryngectomy and construction of a T-E shunt. Presented at the American Speech and Hearing Association Annual Convention, Detroit, Michigan, 1973
10. Snidecor JC: *Speech Rehabilitation of the Laryngectomy*. Springfield, Illinois, Charles C Thomas, 1969
11. Berlin CI: Cinical measurement of esophageal speech III. J Speech Hear Disord 30:174-183, 1965
12. Blom ED, Baker OJ: A preliminary investigation of speech with an air bypass voice prosthesis. J Speech Hear Disord (in press)
13. Snidecor JC, Isshiki N: Air volume and air flow relationships of six male esophageal speakers. J Speech Hear Disord 30:205-216, 1965
14. Creech HP: Evaluating esophageal speech. J Speech Hear Assoc Virginia 2:13-19, 1966

A TECHNIQUE FOR IMPROVING ESOPHAGEAL AND TRACHEOPHARYNGEAL SPEECH

WILLIAM W. MONTGOMERY, M.D.

WILLIAM G. LAVELLE, M.D.

BOSTON, MASSACHUSETTS

SUMMARY—Phonation in both excellent and poor esophageal and tracheopharyngeal speakers was studied radiographically and was recorded to evaluate volume and pitch. Sphincteric function usually occurred at the inferior constrictor level in those speakers with satisfactory phonation; a lack of sphincteric function was noted as cause for poor esophageal and tracheopharyngeal speech. An operative procedure, the sternomastoid muscle swing operation, is introduced as a method of providing the laryngectomee with an additional mechanism for improving both the volume and the pitch of esophageal and tracheopharyngeal speech. In addition, the presence of the muscle above the mucosal tube and anterior to the reconstructed hypopharynx adds support and blood supply. The presence of the muscle bulk anterior to the reconstructed pharynx definitely reduces the incidence of salivary leakage through the mucosal tube.

Good esophageal voice is still the preferred method of artificial speech following total laryngectomy. It requires no valve or finger occlusion at the tracheostoma, it is the least troublesome and most convenient speech, and it requires no additional surgery following the total laryngectomy. Unfortunately, approximately 40%¹⁻³ of laryngectomees are not able to learn intelligible and socially acceptable esophageal speech.

The percentage of voiceless laryngectomees has been somewhat reduced following the introduction of the electrolarynx² and various operative techniques for establishing tracheopharyngeal speech.⁴⁻¹⁰ Unfortunately, many laryngectomy patients or their families reject the electrolarynx, while others are not suitable candidates for the tracheopharyngeal speech operative procedures.¹¹

Most postoperative laryngectomy patients who acquire intelligible, socially acceptable esophageal speech do so

within six weeks. It is therefore important that the surgeon be equipped to give instruction to his patient during the first postoperative week. Many patients so instructed can utter two to three word sequences within the first two weeks following surgery. In order for a patient to master esophageal speech he must develop a method of taking air into the esophagus by either swallowing or by elevating the rib cage and expanding the chest. This ingested air must be returned to the pharynx where it is converted to sound by a constriction of the hypopharynx forming a "pseudoglottis." Those patients who cannot learn esophageal speech lack the facility for ingesting air into the esophagus, the ability to return air to the hypopharyngeal level, or the function of the sphincter at the pharyngeal level.

Our initial objective in this study was the evaluation of the mechanism of "phonation" in patients who demonstrate good esophageal or tracheopharyngeal speech. The speech of each

From the Massachusetts Eye and Ear Infirmary, Boston, Mass.

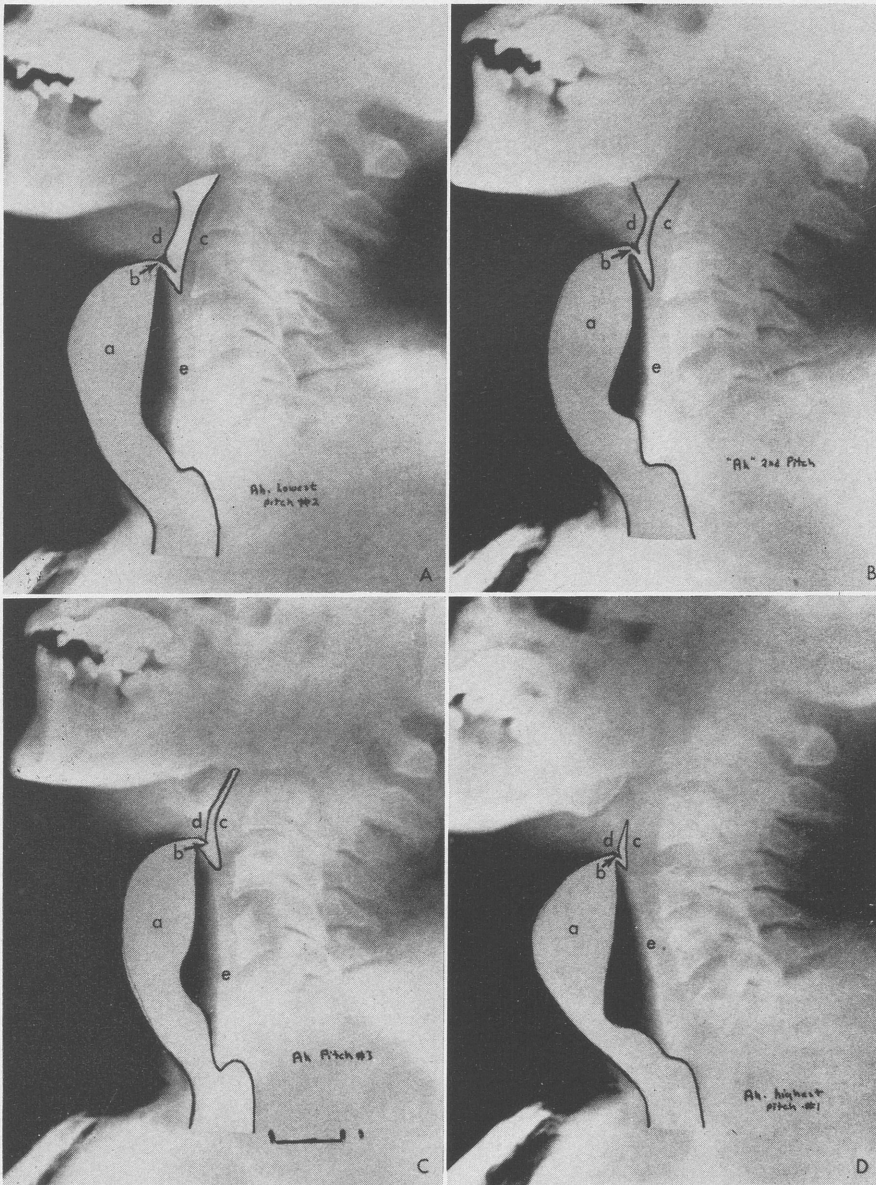


Fig. 1. Phonation at the middle constrictor level. The x-rays were taken as the pitch was gradually increased by one octave; a) skin tube, b) mucosal tube, c) middle constrictor muscle, d) base of tongue, and e) esophagus (closed).

patient was recorded to evaluate the range of volume and pitch as well as the quality of speech. These patients were studied radiographically using cine fluoroscopy and lateral neck soft tissue x-rays (58-62 kv). The studies were performed after premedicating the

patient with atropine (0.5 mg) and using radiopaque contrast materials in order to more clearly outline the hypopharyngeal and esophageal mucosal surfaces. It was clear from these studies that the mechanisms for phonation were the same with good esophageal and

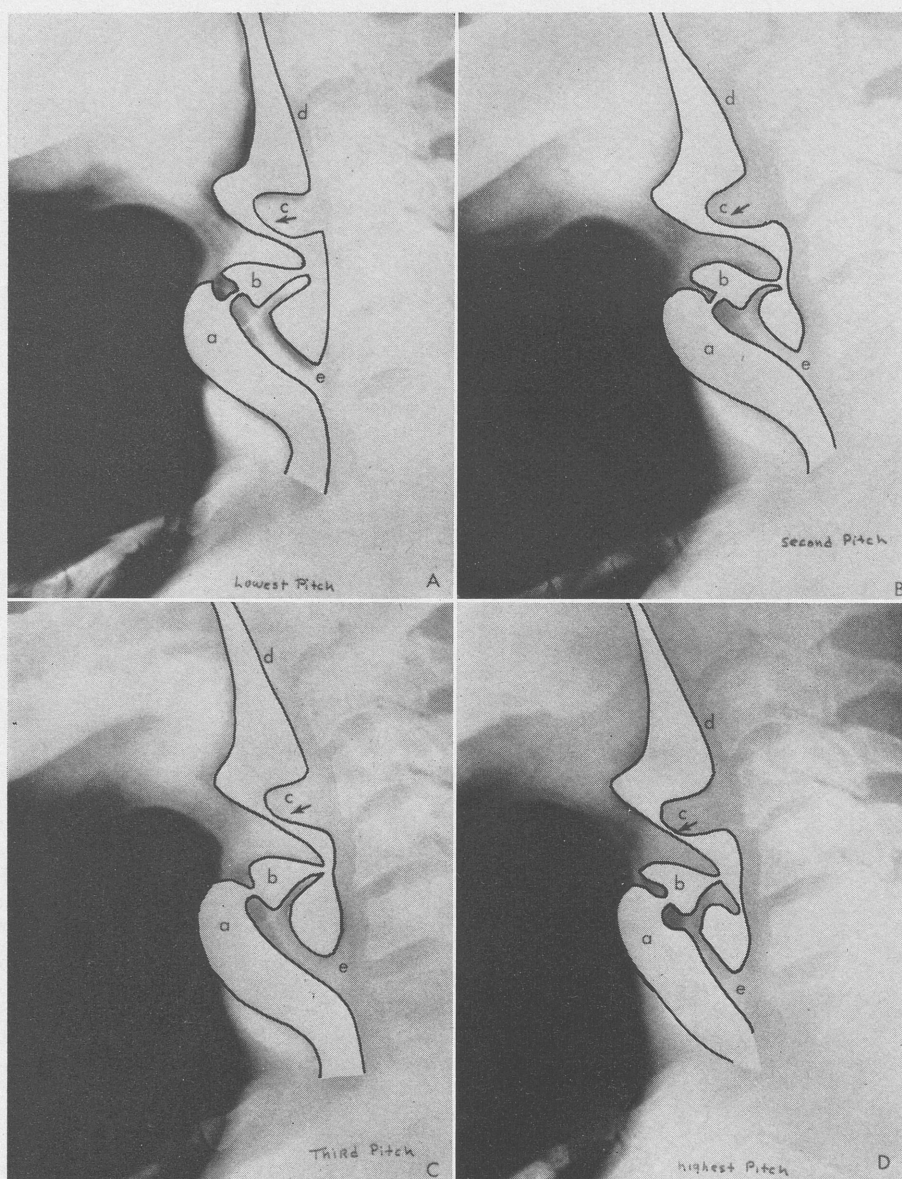


Fig. 2. Phonation at the inferior constrictor muscle level (arrows). The x-rays were taken as pitch was gradually increased by one octave; a) skin tube, b) mucosal tube, c) inferior constrictor muscle, d) middle constrictor muscle and e) esophagus (closed).

tracheopharyngeal speech. The constriction for phonation appeared most frequently at the level of the fourth or fifth cervical vertebrae or the inferior aspect of the inferior constrictor muscle (cricopharyngeus muscle). A second position for phonation was at the mid-

dle constrictor muscle level. Phonation occurred here as the middle constrictor muscle contracted against the base of the tongue. An example of phonation at the middle constrictor level is demonstrated radiographically in Figure 1. This patient has excellent tracheo-

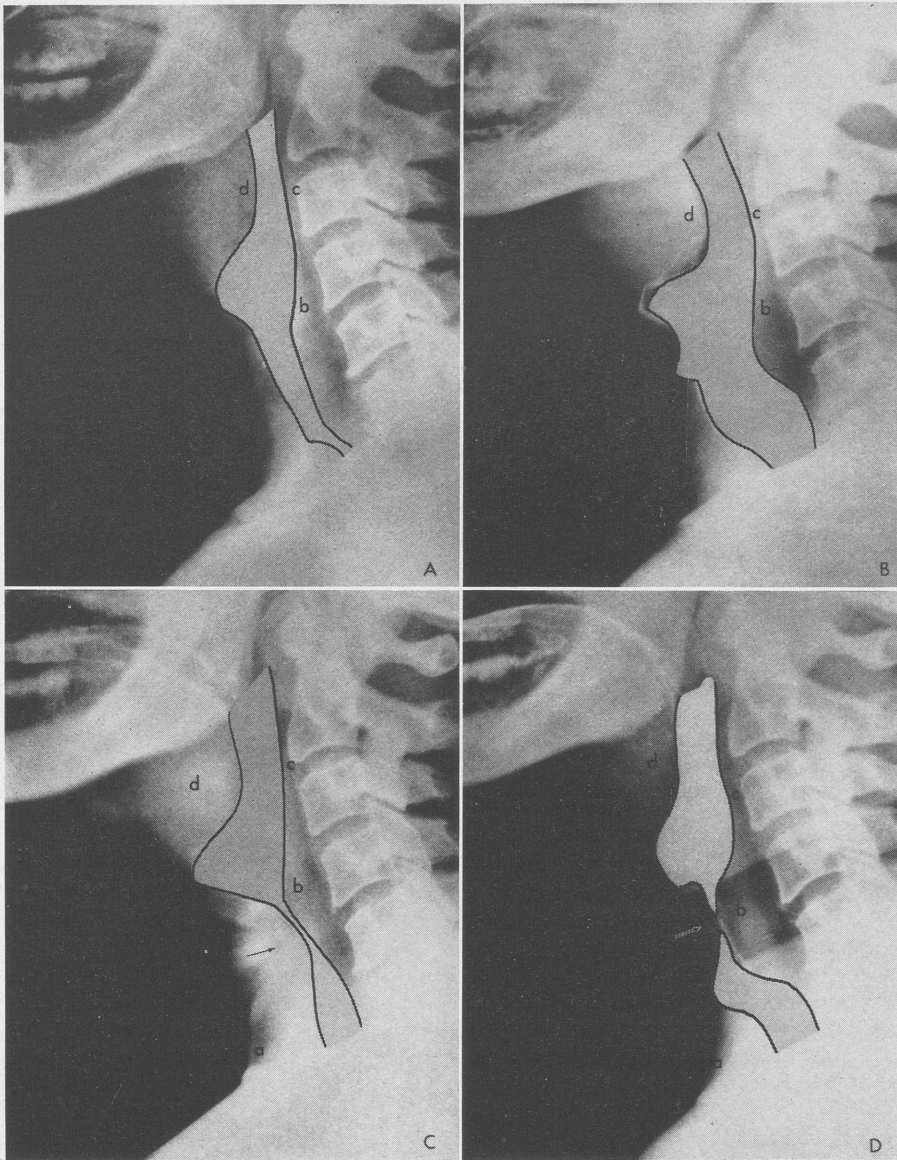


Fig. 3. A patient with poor esophageal speech which is improved by anterior cervical pressure; a) tracheostoma, b) inferior constrictor muscle, c) middle constrictor muscle and d) base of tongue. A) The patient at rest. B) The hypopharynx dilates as the patient attempts esophageal speech without success. C) Good esophageal speech as the patient presses against the anterior neck with his finger. D) Esophageal speech with pressure exerted by the apparatus shown in Figure 4.

pharyngeal speech, having nearly normal volume range and being able to vary the pitch of his speech more than one octave. The middle constrictor muscle gradually contracts against the base of the tongue as the pitch is increased

by one octave. It is of note that as the pitch increases, the volume of the skin tube and the diameter of the mucosal tube remains constant. The cervical esophagus remains closed at all times. During this study the volume of phona-

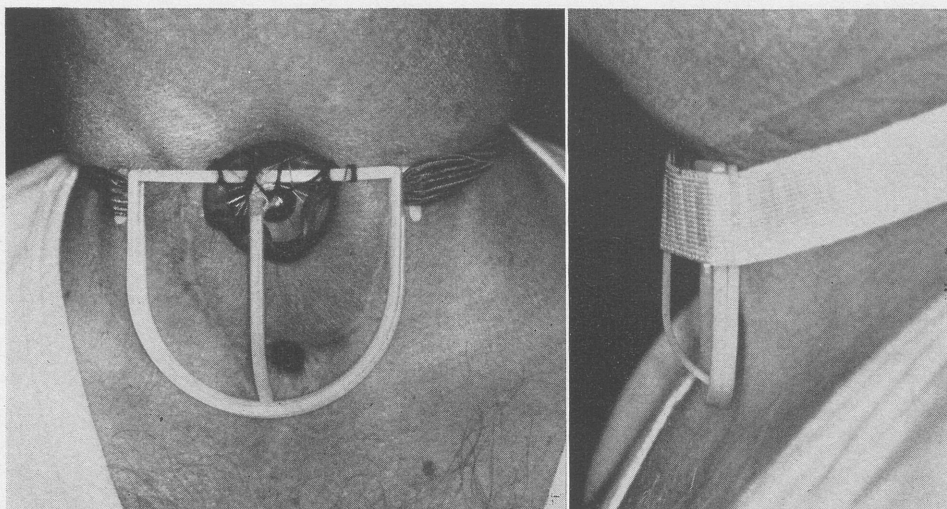


Fig. 4. The device used by the patient described in Figure 3. A) Front view. B) Side view.

tion remained maximally constant.

Most patients with esophageal or tracheopharyngeal speech phonate at the inferior constrictor muscle level. One such patient (Fig. 2) is a salesman who has excellent tracheopharyngeal speech and is able to sing quite well. The volume of the skin tube and mucosal tube (which is somewhat dilated) does not appreciably increase as the pitch is increased by one octave. The inferior constrictor muscle gradually decreases the size of the hypopharyngeal lumen as pitch is increased. During this study the volume of phonation remains constant at maximum intensity, the middle constrictor muscle does not contract, and the cervical esophagus remains closed. Good tracheopharyngeal speech far surpasses good esophageal speech because the former patients can easily regulate the pressure and flow of expired air by way of the trachea. This is usually not possible with air returned from the esophagus.

Next we studied patients with poor esophageal or tracheopharyngeal speech. In both cases it was apparent that they lacked the required sphincteric function at the hypopharyngeal level to form an effective pseudoglottis,

despite their having mastered the art of ingesting air into the esophagus and returning it to the hypopharynx.

So often it is a patient who initiates or rekindles one's enthusiasm for improvement in therapy. A 58-year-old laryngectomee was able to produce two and three word sequences by esophageal speech one week following his total laryngectomy. His esophageal speech gradually improved during the following month and then deteriorated (Figs. 3A and 3B). Soon he discovered that he could greatly improve his speech by applying pressure with his finger against the anterior cervical region (Fig. 3C). He then fashioned a device which is shown in Figure 4. With this device in place, digital pressure was not necessary to produce good, intelligible esophageal speech. The x-ray in Figure 3B demonstrates his unsuccessful attempt to phonate without anterior cervical pressure. The inferior constrictor muscle is contracting without effect and there is a widening of the hypopharynx during attempted speech. With anterior cervical pressure (Figs. 3C and 3D) against the contracting inferior constrictor muscle the phonatory mechanism is quite efficient. Why could not some surgical procedure replace the de-

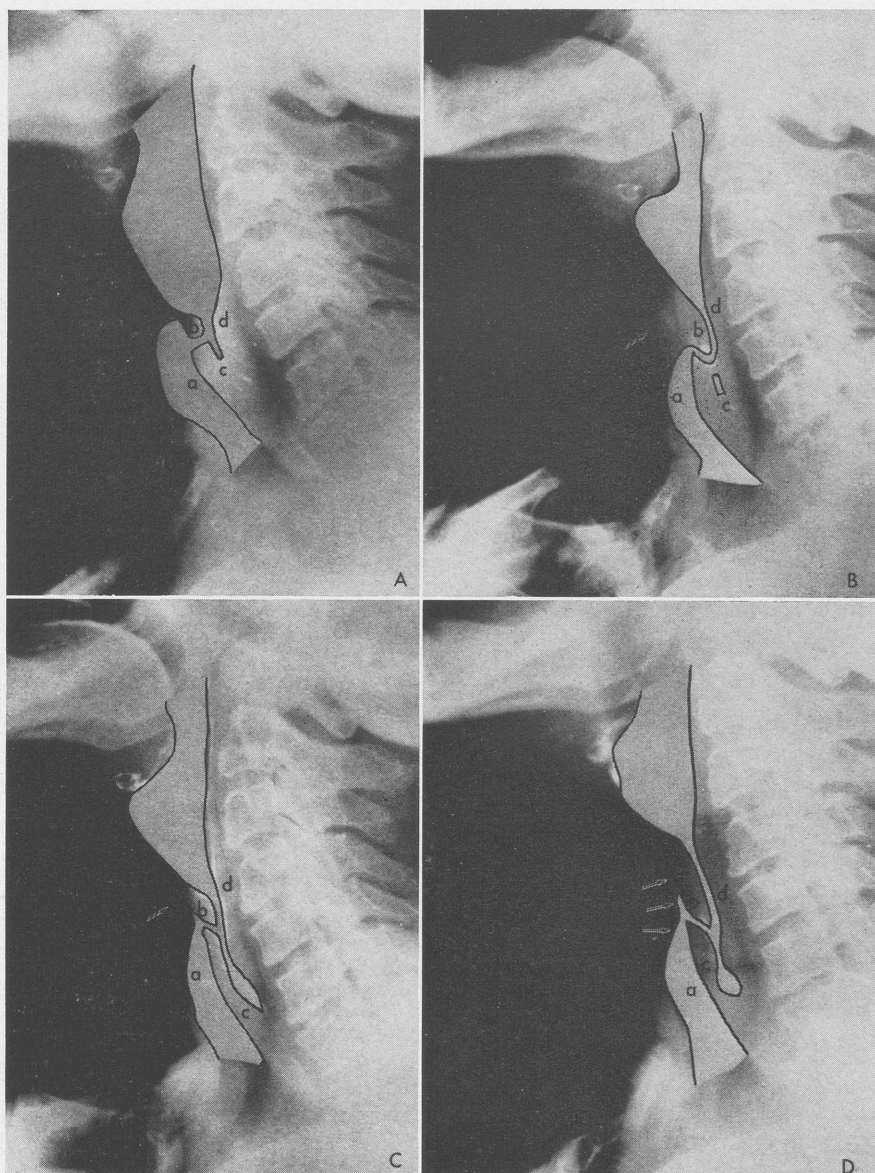


Fig. 5. A patient with poor tracheopharyngeal speech, which is improved by anterior cervical pressure; a) skin tube, b) mucosal tube, c) esophagus (closed) and d) inferior constrictor muscle. A) Poor tracheopharyngeal speech. B and C) Speech improved by anterior cervical pressure (finger). D) An elastic neck band is used to improve tracheopharyngeal speech.

vice which exerts anterior cervical pressure?

An additional patient is presented to demonstrate inadequate phonatory function with tracheopharyngeal speech. He was unable to vary

pitch and his volume range was quite poor. Figure 5A demonstrates a patent skin tube and mucosal tube. The esophagus closes nicely below the level of the mucosal tube inlet during phonation. The inferior constrictor, however,

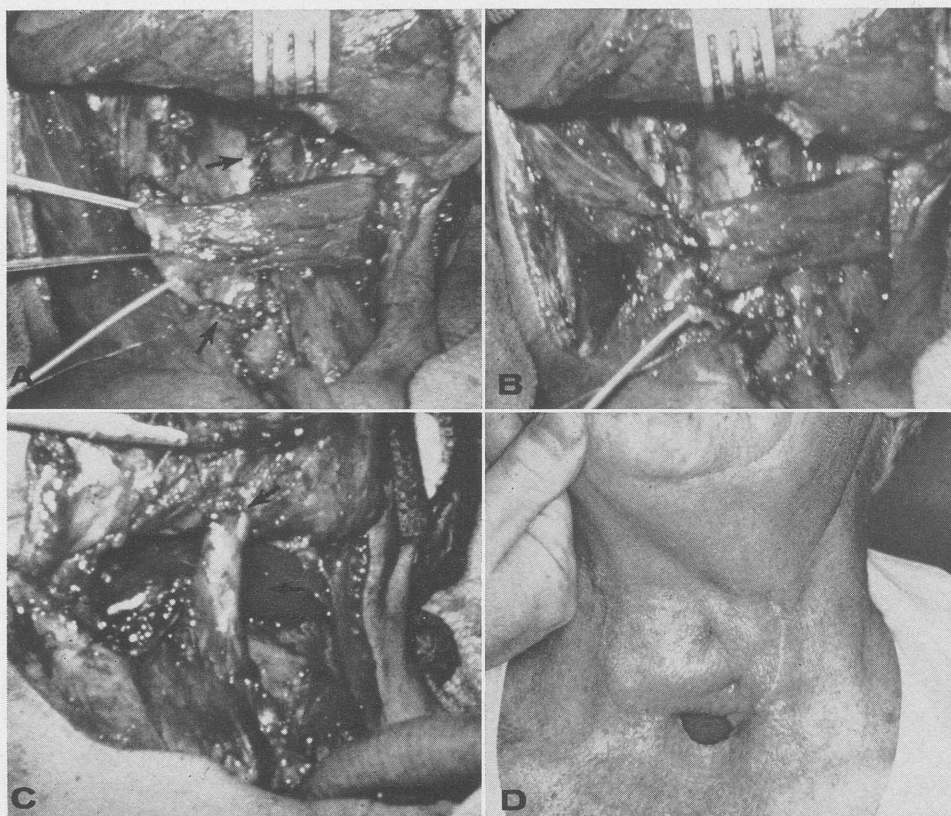


Fig. 6. A) The hypopharynx (upper arrow) has been repaired and a mucosal tube (lower arrow) constructed following total laryngectomy. The sternal head of the sternocleidomastoid muscle has been detached at its origin and is being pulled to the opposite side. B) The left sternomastoid muscle has been sutured to the anterior border of the right sternomastoid muscle and silicone tubing inserted in the mucosal tube. C) The mucosal tube has been sutured to a trephine opening in the skin flap (upper arrow). The lower arrow points to the repositioned left sternomastoid muscle. D) Contraction of the repositioned left sternomastoid muscle can be palpated and visualized as the patient attempts to turn his head to the right against resistance.

does not contract above this level, thus accounting for his poor phonatory function. Figures 5B and 5C demonstrate the patient phonating effectively at a low pitch and high pitch by exerting pressure against the anterior cervical region. Pitch is elevated by increasing the pressure against the anterior cervical region. Note that the inferior and middle constrictor muscles remain functionless. In Figure 5D an elastic tape around the upper neck has replaced his finger. With this in place his tracheopharyngeal speech is quite good. As would be expected, the pitch range is less than with digital pressure.

Four other patients with poor tracheopharyngeal speech have been able to increase the volume and variability of pitch by applying pressure against the anterior cervical region. Another patient, a policeman, has quite good tracheopharyngeal speech for ordinary conversation. He wears an elastic strip around his neck when performing such duties as directing traffic.

With our present techniques there is no way to determine at the time of laryngectomy whether or not the middle or inferior constrictor muscle will function to serve as a sphincter for phonation. The primary purpose of this

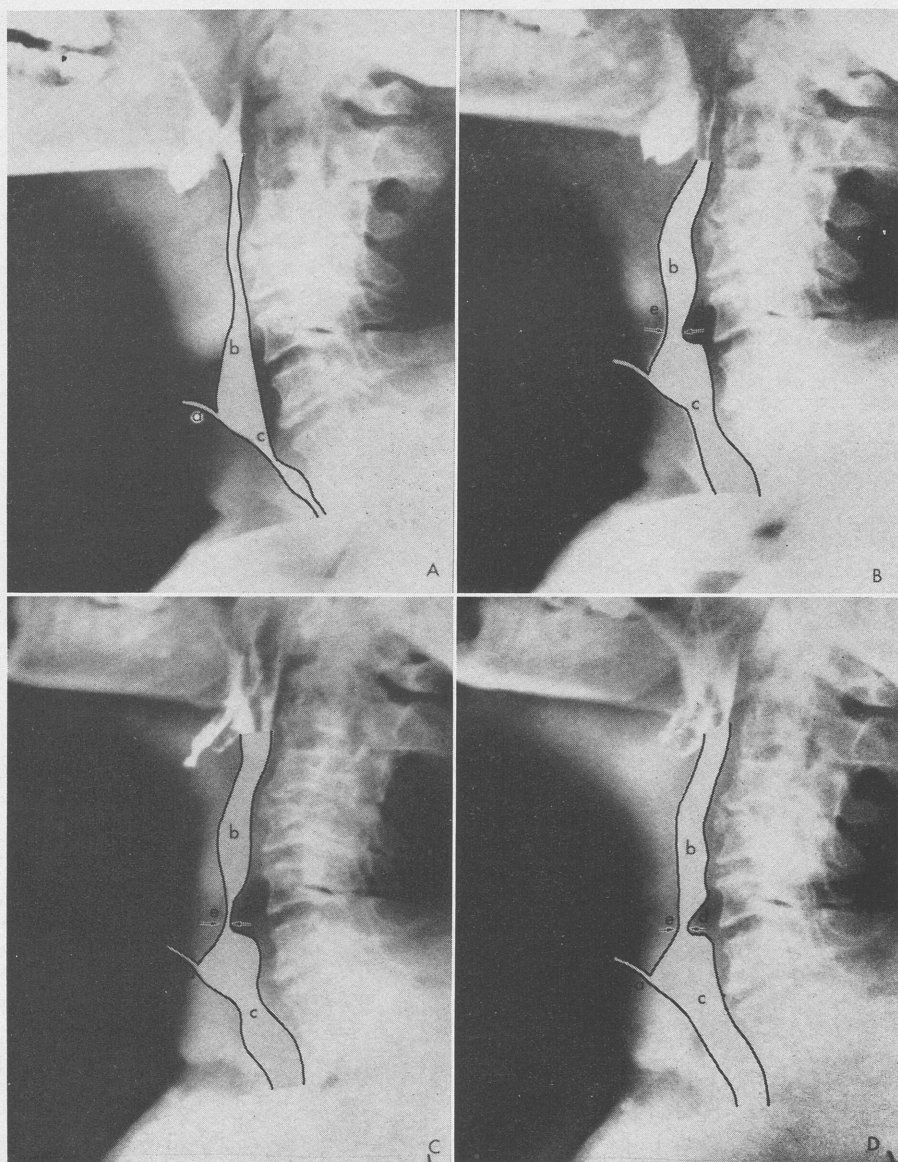


Fig. 7. X-rays of laryngectomee (esophageal speech) with sternomastoid muscle swing procedure; a) mucosal tube, b) hypopharynx, c) esophagus, d) inferior constrictor muscle, and e) sternomastoid muscle. The arrows indicate the direction of muscle contraction to form pseudoglottis. A) At rest. B) Low pitch phonation. C) High pitched phonation. D) Low pitch phonation as the patient attempts to turn his head to the right against resistance in order to contract the left sternomastoid muscle (Fig. 6D). The anterior muscle bulk increases as that of the inferior constrictor decreases.

paper is to introduce a technique which should serve to reinforce or be responsible for a consistently effective phonatory mechanism at the hypopharyngeal level. The procedure is re-

ferred to as the sternomastoid muscle swing operation. This operation is a simple procedure which adds no more than 15 minutes to the duration of surgery. In addition to the first stage

tracheopharyngeal speech procedure, a sternomastoid swing procedure has been performed on five laryngectomees. Four of the five developed intelligible and socially acceptable esophageal speech. The fifth could not master the technique of esophageal speech. This patient has very good speech following a second stage tracheopharyngeal speech operation.

TECHNIQUE OF THE STERNOMASTOID MUSCLE SWING OPERATION

The sterno and clavicular heads of the sternocleidomastoid muscle are exposed inferiorly to the level of their attachment to the clavicle and sternum. The two portions of the muscle are carefully separated at their origin. A dissection to separate the two portions of the sternocleidomastoid muscle is continued superiorly only as high as is necessary in order to obtain sufficient length for a swing in order to avoid disturbing its innervation which enters superiorly. The sternal head is sectioned just above its attachment to the sternum and clavicle and swung across the repaired hypopharynx just above the mucosal tube (Fig. 6A). It is attached to the opposite sternocleidomastoid muscle (Figs. 6B and 6C) or, if a radical neck dissection has been performed, to the prevertebral fascia. It is important that the muscle be sufficiently freed so, when sutured to the opposite side, it is not under tension.

Approximately two weeks following surgery, the relocated sternomastoid muscle can be palpated as it contracts against the patient's efforts to turn his head to the opposite side against resistance (Fig. 6D). Radiographic studies were performed on a patient two weeks following a total laryngectomy, first stage tracheopharyngeal speech operation, and a sternomastoid muscle swing procedure. His esophageal speech

had developed sufficiently so that he no longer needed a pad and pencil. Barium was injected into the mucosal tube to demonstrate its position. There was no leakage from this mucosal tube as the patient ate or drank. The bulk of the inferior constrictor muscle increased as he phonated. The bulk of this muscle further increased as he raised the pitch of his speech. The final x-ray (Fig. 7D) was taken as the patient phonated and at the same time turned his head against resistance in order to tense the left sternomastoid muscle. The efficiency of the phonation was increased by this maneuver.

CONCLUSIONS

The mechanism of phonation with esophageal and tracheopharyngeal speech has been demonstrated. The lack of the sphincteric function for phonation has been established as a cause for poor esophageal and tracheopharyngeal speech.

We are now using a procedure referred to as the sternomastoid muscle swing operation in addition to the first stage tracheopharyngeal speech procedure for the following reasons:

1. The pressure exerted by the muscle bulk anterior to the reconstructed pharynx above the level of the mucosal tube definitely reduces the incidence of salivary leakage.
2. The presence of the muscle above the mucosal tube and anterior to the reconstructed hypopharynx adds additional support and blood supplies to these structures.
3. It is speculated that the functioning muscle anterior to the hypopharynx and above the level of the mucosal tube will provide the patient with an additional mechanism for improving both the volume and the pitch of esophageal and tracheopharyngeal speech.

MASSACHUSETTS EYE AND EAR INFIRMARY, 243 CHARLES ST., BOSTON, MASS. 02114

REFERENCES

1. Gardner WH, Harris HE: Aids and devices for laryngectomees. *Arch Otolaryngol* 73:145-152, 1961
2. Martin H: Rehabilitation of the laryngectomee. *Cancer* 16:823-841, 1963
3. Putney FJ: Rehabilitation of postlaryngectomized patient; specific discussion of failures, advanced and difficult technical prob-

lems. *Ann Otol Rhinol Laryngol* 67:544-549, 1958

4. Czerny V: Versuche uber kehlkopf-exstirpation. *Med Wschr* 27:559, 1870

5. Briani AA: Recuperation sociale des laryngectomises par une methode operateiroe personelle. *L'Evolution Medicale* 3:17-25, 1959

6. Conley JJ, De Amesti F, Pierce MK: A new surgical technique for the vocal rehabilitation of the laryngectomized patient. *Ann Otol Rhinol Laryngol* 67:655, 1958

7. Conley JJ: Vocal rehabilitation by autogenous vein graft. *Ann Otol Rhinol Laryngol*

68:990, 1959

8. Asai R: Asai's new voice production method: a substitution for human speech (read before the 8th International Congress of Otorhinolaryngology, Tokyo), 1965

9. Miller AH: First experiences with the Asai Technique for vocal rehabilitation after total laryngectomy. *Ann Otol* 76:829, 1967

10. Montgomery WW: Voice rehabilitation after laryngectomy. *Arch Otolaryngol* 88:499-506, 1968

11. Montgomery WW: *Surgery of the Upper Respiratory System*, Vol II, Chapter 7. Philadelphia, Lea & Febiger, 1973

ASAI TECHNIQUE FOR VOCAL REHABILITATION

ALDEN H. MILLER, M.D.

LOS ANGELES, CALIFORNIA

More than eight years of experience with Dr. Asai's technique of vocal rehabilitation after total laryngectomy has convinced me that it is most worthwhile to be able to offer patients a surgical procedure that can result in a very good, almost normal or excellent voice.

These experiences include between 40 to 50 patients counting the conversions in the county hospital patients.

These experiences now lead me to offer this technique, as one of three alternatives, to the patient who has just been told that he should have a total laryngectomy.

It is also an excellent procedure to be able to offer to the patient who has already had a total laryngectomy and who has been unable to learn a satisfactory esophageal voice and who is not satisfied with using a mechanical device.

Now, in order to stay within my ten or fifteen minutes, let me quickly run through some slides to refresh your

memory a bit and give you something to compare.

(Slide) This is a drawing of the end of the first stage of the Asai. Two tracheal openings are present. The one above is the ordinary stump of the trachea stoma in the laryngectomy vertical incision. Four or five tracheal rings lower, a second tracheal stoma is present, which is going to be the patient's permanent stoma for breathing.

The second stage has the same two stomata below, but you see the third stoma above which leads from skin to the hypopharynx.

Another month or so later, a dermal tube has been formed which has the tracheal stump opening, the highest tracheal opening at the lower end of the dermal tube and the opening into the hypopharynx is in the upper end of the dermal tube.

(Slide) Here you see the conclusion of a standard total wide-field laryngec-

tomy. You can do it either way first. You can make the second permanent tracheal stoma first, but I now prefer to first bring my tracheal stump up.

I usually have to narrow, as you see here, the lower end of the laryngectomy incision with two to three sutures so as to place the tracheal stump quite high, then slip down and make the second tracheal opening.

(Slide) This is that same patient just before we are ready to do the second stage which is a month later. The angle of the camera is such that you cannot see down the upper tracheal stoma but you will in a moment.

(Slide) Here is the patient at the completion of that second stage which consisted of simply following a needle in from the outside using a laryngoscope to make sure that you bring the needle out from under the overhang of either the base of the tongue or under the anterior half of the floor of the vallecula.

(Slide) Here we are at the end of the second stage.

This shows the island of skin that is being outlined with a marking pencil. This is the key part of the Asai operation.

(Slide) You will see the lower stoma down in the bottom and you will see the dimple of the hypopharyngeal stoma.

In making this island of skin which you are going to simply incise, one makes the outline 1.3 cm on each side of the vertical midline of the neck and curves it up and over the hypopharyngeal stoma, the same 1.3 cm and below and down under the uppermost tracheal stoma, that same amount.

Now, the last time I talked with Dr. Asai, I was pretty well convinced that he makes it 1.5 cm from the midline in all directions and to me this explains why he does not seem to have as many stenoses as I have; but there is not any doubt from the patients I have, the finest voices are in those that end up with the biggest opening of the dermal

tube into the hypopharynx.

The two or three that I have that wear an ace bandage, and the two that use a second finger while talking in order to press in with that second finger on the dermal tube to get the finest voices, prove to me that the big opening into the hypopharynx gives the finest voices.

The remainder of this third and final stage (slide) is done over a tube, put in simply to have something to make it a little bit easier for suturing the edges of the dermal tube together, just like your grandmother had that gadget inside the sock when she was darning.

(Slide) And, here, the edges have simply been brought together and the completed tube has been buried under the skin.

Let us go then to what my experiences seem to have taught me. Remember I said I give every patient who is contemplating his laryngectomy three choices, three ways to go. One is the standard total wide-field laryngectomy followed by lessons in esophageal speech.

We do suggest to these people there is that possibility that they can use a mechanical device, maybe, if they fail to obtain an adequate esophageal voice.

Another, the first alternative, of course, is the Asai.

Now, the third alternative is the performance of the standard total laryngectomy with the provision that the tracheal stoma will be placed about 2 cm higher than usual placement.

This will afford an area of skin between the stoma and the suprasternal notch which would allow for easy forming of the second lower tracheal stoma of the Asai technique, in case failure in learning adequate esophageal voice prompts these patients to now request the Asai procedure.

It is interesting to me that in offering the three alternatives during the past four years, 75% of my patients have

chosen this third alternative: that is, the one single stoma highly placed.

And, again, only 15% of those who wanted the high stoma to start with, have elected later to go on to the first stage of the Asai. Only 10% of all my recent patients have chosen the standard laryngectomy. Of those who elected the initial high single stoma only one in five have been dissatisfied with their esophageal voice and have elected to be converted to the Asai technique.

Twenty percent of the patients with the completed three-stage technique have excellent to almost normal voices.

Another 60% have had an adequately loud but somewhat forced, low-pitched voice.

The other 10% had a weak low pitched voice, while the last 10% have a voice which is just a hoarse whisper.

So far every completed patient is still happy and pleased with his choice of treatment.

Even those with the poor voices are convinced that their ability to speak in normally long sentences and with a "normal kind of voice," even though weak and hoarse, is preferable to them over the average esophageal voice.

To all of my patients the necessity of covering the tracheal stoma when speaking and the use of digital pressure over the end of the upper end of the dermal tube by some of them in swallowing liquids, are small inconveniences to pay for having their voices.

Now, there have been some complications and partial failures.

Two patients, one a conversion of an old laryngectomy, must be considered failures during the first stage as the bridge of skin between the two tracheal stomata sloughed out. As soon as I stopped using a horizontal incision for the second tracheal stoma this never happened again. However, both of these patients also had had neck dissection, one bilateral. I had two patients who had had cobalt irradiation and

they were cobalt failures. They were failures as far as the Asai technique was concerned because I ran into all kinds of problems.

I got them both past the first stage, but in trying to do the second stage, huge hypopharyngeal openings occurred.

I should stop right here and say that I advise everyone thinking of the Asai: do not pick neck dissection patients the first few times and above all, do not pick cobalt irradiated patients.

However, I do hasten to add that I have at least five successful Asai's in cobalt irradiated patients.

Two other patients of the cobalt group insisted upon my trying the technique even though I was not in favor of it at the completion of the second stage. These were the two in which the hypopharyngeal stoma could not be narrowed enough to allow the dermal tube to be formed safely, in my opinion.

The remainder of the patients had their surgical rehabilitation completed. However, eight have had to have revisions. In five of these, the lumen of the hypopharyngeal stoma was soon too small after the formation of the dermal tube and had to be enlarged. One only had the tracheal end of the dermal tube stenose down and actually close. But in all of these we were able to enlarge them and get a voice.

In one patient the hypopharyngeal stoma was too low and it had to be closed and a higher one made into the hypopharynx under the overhang of the remaining floor of the vallecula before we completed the third stage.

In another patient, the hypopharyngeal stoma remained too large and had to be narrowed before the third stage was performed.

In four completed patients, the diameter of the dermal tube seemed too large, that is the four that must use pressure with the use of a second finger or by wearing ace bandages around their necks.

It is eight years and about 50 patients, and there have been four deaths

that I know of. In only one was residual disease demonstrated in the neck.

MODERATOR'S CLOSING REMARKS

We are indebted to Dr. Taub for his experience and as you can see he has had the common heartaches that are inherent in this program; namely, and primarily, salivary leak, closure of fistula, psychological inability to adapt, irritation of the skin about the stoma and neck and carotid artery hemorrhage.

I think he has studied these complications in such a way that he is now ahead of most of them and people are adapting to his mechanism quite successfully in a high percentage of cases.

Dr. Komorn, I think a record of 69% with this operation is a very happy record and it basically appears to be a good operation.

We did this operation about 20 years ago, did it in 42 patients and I think we had a little higher incidence of complications than you had. One of the things that impressed me was the motivation of the patient, but I think, really, to carry on this work that the surgeon has to have very high motivation and perseverance, also.

I hope we do not get any criticism from the urological surgeons because Dr. Montgomery has demonstrated sort of the classical operation for the correction of hypospadias. There is nothing that Bill likes more than being imaginative and sexy at the same time!

As you can see, Dr. Miller has had considerable experience with the laryngeal tunnel.

Dr. Miller, I do appreciate the balance and the words of caution which you had for this procedure and you have made it rational. You have involved the patient in the final decision making.

It is not all the enthusiasm of the surgeon, although this is quite an important ingredient and on the basis of this evolutionary phenomenon and your attitude, the number of people

who select this has dropped to about 20%.

So, although we emotionally feel that everyone who is denied a human voice wants it back, Dr. Miller has told us that only about 20% of his patients do this. Whether that is a reflection of his personal reaction to this phenomenon or the patient's, I think is something you will have to decide.

Now, I would just like to add one note. As I stated, the Americans are great tunnelers. One of the things the American civilization will be noted for will be building, building roads and skyscrapers and jet airplanes and everything else imaginable and we are certainly building enough tunnels. But I think that there is a real new evolutionary wave coming in this, in Europe primarily, in Northern Italy, in the Arslan Clinic and Dr. Vega in Madrid. They have developed another concept of this and this is the immediate reconstruction of the airway internally. In other words, to try to do what Dr. Ogura showed us you could do with the trachea, to bring it together by direct approximation. This is being attempted in Europe in several of the clinics and, of course, they are running into the inevitable problem of aspiration.

I think again, however, that some of their operations are quite ingenious using some of the regional muscles and cartilages in the neck. Some of them are saving some portions of the thyroid cartilage and perichondrium; some of them are using flaps from the pyriform fossa. Some are developing membranes over the tracheal stoma and perforating this as a tailor's button would be. I think Vega is doing this. Some are compromising and leaving a Tucker type tracheostomy tube in for diverting the air channel and there is another movement coming into effect.

I think that this will be a very interesting movement to follow.

EXPERIENCES WITH THE CARBON DIOXIDE LASER IN THE LARYNX

ALBERT H. ANDREWS, JR., M.D.

HAROLD W. MOSS, M.D.

CHICAGO, ILLINOIS

SUMMARY—Techniques for the application of the carbon dioxide laser to laryngeal surgery are outlined and include operative and anesthetic management. Laser surgery teaches improved surgical judgment in and application of conventional procedures. The lack of trauma, the degree of precision and the speed of healing as seen in one year of experience indicate the results of laser surgery to be superior to conventional techniques in the treatment of papilloma, polyps, polypoid degeneration, hyperkeratosis and carcinoma *in situ*. A family of laryngeal retractors is introduced whose utilization with intralaryngeal mirrors makes essentially all areas of the larynx accessible for lasing.

The carbon dioxide laser produces a beam of infrared light which applies energy to a small area and thereby destroys biological tissue by the process of heating, burning and vaporization. Polanyi et al¹ have described the mechanisms involved in the production of laser beam and they will not be reviewed at this time. For use in the larynx, the laser is applied through the Zeiss operating microscope* and guided by a small aiming light (Fig. 1). The beam, about 2 mm in diameter, is controlled by the movement of the "joy stick" and the intensity of the energy in the beam is controlled by the power applied to the lasing chambers (Fig. 2).

This paper presents some of the techniques used in laser surgery of the larynx and is based on the application of the laser to 41 patients ranging in ages from three to 73 years who have received 58 laser procedures over a twelve month period (Table I). This time interval is insufficient to make an adequate evaluation of the long term prognosis, particularly in the difficult areas of

papilloma and carcinoma *in situ*. However, our results so far have been encouraging and lead us to have a certain degree of optimism. We have been impressed, like Strong and Jako,² with the precision of the surgical procedures, the absence of bleeding and the lack of postoperative reaction in the early and late recovery periods.

OBSERVATIONS

Safety Management. The guarded foot pedal prevents inadvertent operation of the timer mechanism. The spring of the foot pedal must be strong enough to prevent inadvertent operation when placing the foot inside the guard. An interlock is provided on the cabinet front door so that exposure to the high voltage is avoided.

The laser beam is absorbed by biological tissue, glass and plastics and reflected by metal surfaces. For eye protection, everyone in the operating room must wear glasses and the patient's eyelids taped closed and covered.³

* Carl Zeiss, New York, N. Y.

From the Department of Otolaryngology, Abraham Lincoln School of Medicine, College of Medicine of the University of Illinois at the Medical Center, Chicago, Illinois.

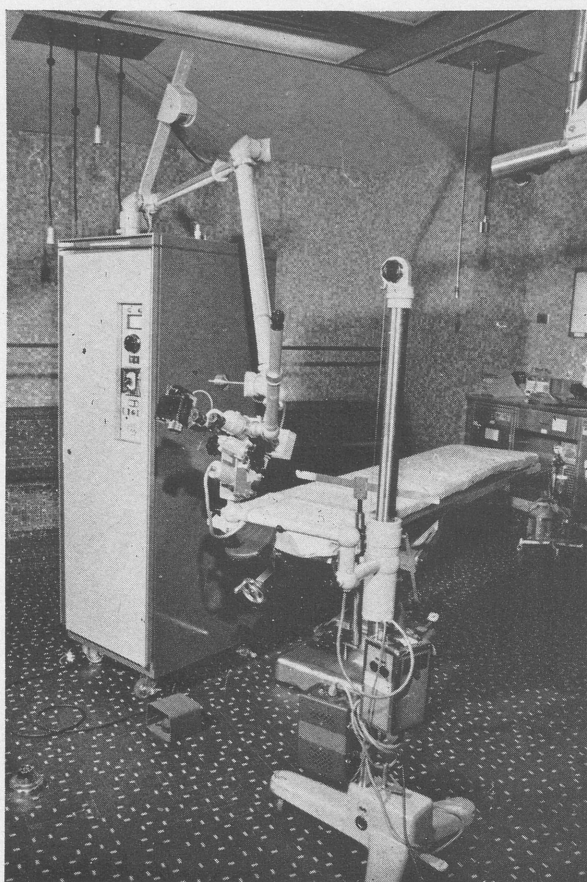


Fig. 1. Arrangement for laser surgery. The micromanipulator is attached to the articulated tubing from the cabinet and to the operating microscope with the 400 mm lens. The guarded foot switch is on the floor and the Haslinger-Andrews headrest* and Killian suspension gallows* are attached to the table.

When using a small laryngoscope, coincidence of the laser and visual axes becomes critical and the patient's lips are protected by moist gauze in case of unrecognized maladjustment.

The laser is never activated without a target to absorb the beam. The beam is focused at 400 mm, so at a distance of a few feet the beam diverges to an extent that the energy is spread over a wide area. For this reason special wall and ceiling protection is not required as it may be with other types of lasers.

Anesthesia. Because of intense heat, the laser must not be used with flam-

mable gases. Plastic intratracheal tubes are easily penetrated by the beam so that only red rubber intratracheal catheters which have been shown to be resistant to the laser beam are used.⁴ The cuff on the intratracheal catheter is penetrated by one exposure at the lowest power setting and shortest duration so it must always be protected by small cottonoids on threads soaked in saline and packed between the larynx and the cuff. In addition, this protects the subglottic area of the larynx and the trachea from the beam. It is essential that the intratracheal catheter be long enough to allow space for this packing

* V. Mueller & Co., Niles, Ill.

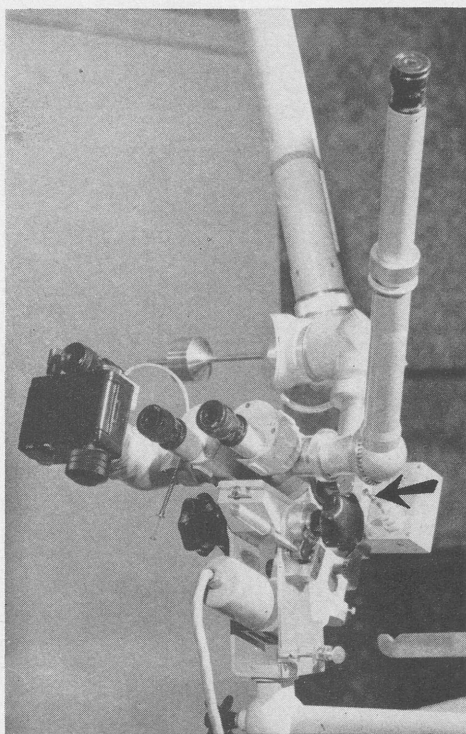


Fig. 2. Control panel micromanipulator and operating microscope. The Kowa endoscopic camera* is mounted on one beam splitter and the observer's tube on the other. The "joy stick" is indicated by the arrow.

between the area to be lased and the cuff, but at the same time, not be placed so low that interference with ventilation occurs. Adequate operative space and ventilation can be maintained with the use of intratracheal catheters size French 20, 22 or 24 in the adult patient. Because of the small size of the catheters, the cuffs are distended quite markedly and usually asymmetrically, so that the anesthesiologist should place the catheter in such a way that the cuff helps to displace the catheter posteriorly rather than anteriorly or to the side, and in that way provide more adequate exposure area. Shaker and Konchigeri⁵ have discussed the anesthesiological aspects of laser surgery with specific reference to high flow rates, small catheters, and blood gas analyses. For additional protection of the intratracheal catheter, taping with adhesive aluminum foil may be required in small children so that the beam is reflected away, assuring against penetrating burns. Berenyi et al⁶ have studied the use of small intratracheal catheters utilizing blood gas analysis and electrocardiography and have concluded that with the proper technique the small catheters provide adequate ventilation.

Biopsy. The histological evaluation

TABLE I

CLASSIFICATION OF DISEASES TREATED DURING
FIRST YEAR OF LASER SURGERY

Diagnosis	No. of Patients	No. of Lasings					Total
		I	II	III	IV	V	
Papilloma	24	15	6	2		1	38
Vocal cord polyp	8	8					8
Polypoid degeneration	1	1					1
Hyperkeratosis	2	1			1		5
Carcinoma <i>in situ</i>	2	2					2
Carcinoma	2	2					2
Vocal nodule	1	1					1
Fibrosis	1	1					1
Total	41						58

* American Optical Machida, Southbridge, Mass.

of tissue removed from the larynx is so important that a biopsy is taken on all patients prior to the lasing. The biopsy is usually taken with cup forceps; however, it may be done with the laser by grasping the tissue, pulling it outward and lasing around the end of the forceps so that the tissue comes away. Following the lasing, an additional biopsy may be taken and is helpful in confirming that the lesion has been completely destroyed. For example, two patients were lased who were thought to have benign lesions on the basis of the indirect laryngoscopy. The biopsies showed squamous cell carcinomas. On one, a biopsy taken after the lasing revealed focal areas of persistent carcinoma. Both received radiation therapy. Also the concept of post lasing biopsy is important in developing and reinforcing surgical judgment of papilloma destruction.

If there is insufficient space for forceps between the micromanipulator and the larynx, the microscope may be racked outward and the focus corrected by adjusting the oculars. Because the laser beam is focused at 400 mm, the oculars are returned to their normal position and the microscope is refocused before lasing.

Laryngoscopes. Because of their large size, the Jako laryngoscopes,* both the adult and small size, are ideal instruments for the lasing procedures. The double illumination provides more adequate light for photography and this is considered advantageous. Care must be used with these instruments to assure that damage is not done to the tongue from the pressure of the laryngoscopes. The adult Jako laryngoscope may not give adequate exposure in patients with prominent teeth or highly arched jaws, as the anterior commissure cannot be adequately exposed even with pressure on the larynx from the outside; so other laryngoscopes must be used. The Nagashima microscopic laryngoscopes**

with their smaller heights can sometimes achieve adequate exposure. When these laryngoscopes do not give adequate exposure, the hourglass laryngoscope is used.

With the smaller laryngoscope it is absolutely essential to know the placement of the laser beam in relationship to the visual pathways. The beam is reflected by a mirror placed between the optical path for each eye. Allowances must be made for the beam to assure that it is not blocked by the proximal opening of the laryngoscope. With the hourglass laryngoscope, only one optical path can be used; therefore, the proper one should be selected in order to allow space for the beam to pass down the lumen. If the wrong optical path is used, the beam is blocked by the proximal opening of the laryngoscope and might even impinge on the lips of the patient.

Strong² has recommended the use of the Killian gallows*** for supporting the laryngoscope. We have confirmed his experience and feel that this is a much more satisfactory form of support than conventional chest supports because it holds much more firmly and solidly. We have had our laryngoscope handles drilled and taped so that a cylindrically grooved rod may be inserted and placed over the hook on the gallows arm.

Depth of Burn. The depth of the burn is controlled by the power and duration of each exposure.⁷ By means of a control knob on the panel of the laser apparatus, the power is regulated in relative watts being used across the lasing chamber. The duration of exposures is usually varied between 0.1 and 0.5 seconds by adjusting the timer, although the actual duration of exposure at the shorter times is longer than indicated because of the inertia in the system.

The judgment of the depth of the burn is a function of the trained eyes

* The Pilling Company, Fort Washington, Pa.

** Nagashima Medical Instruments Co., Tokyo, Japan.

*** V. Mueller & Co., Niles, Ill.

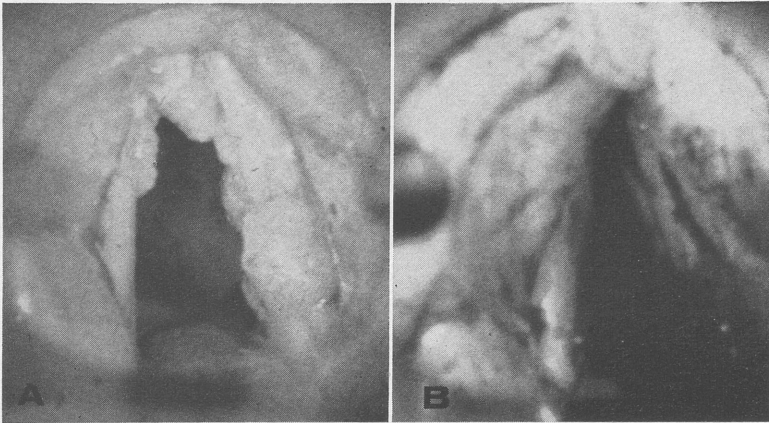


Fig. 3. Adult patient with papilloma, A) before and B) after lasing for the first time.

of experience. The burn is round with sharply demarcated edges and a rather flat bottom. Palpation of the tissue as the lasing proceeds is an important aid to evaluation of the depth required for the destruction. Abnormal tissue as a rule is rather soft and freely movable as can be demonstrated with the open end aspirator, a closed forcep or other instrument. When a mass of a papilloma is destroyed and a fairly flat surface is left, it is not at all unusual to find that there is a layer of papillomatous tissue which is considerably more extensive

than the mass would indicate. As the surface of the mucosa is destroyed, the paler submucosal tissues appear, and as the lasing continues, muscle tissue can be identified by its striated appearance. The regulation of the power duration and number of exposures gives precise control of the depth which is limited only by the ability of the surgeon to identify it visually (Figs. 3 and 4). Like any surgical instrument, the laser can do damage in inexperienced, unskilled or careless hands.

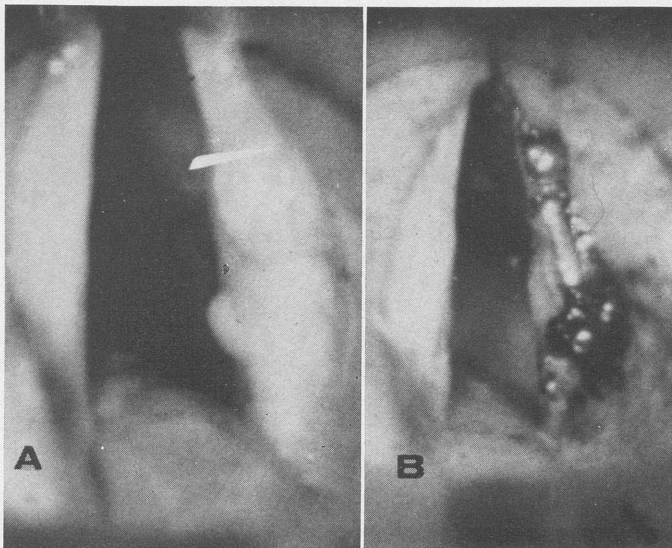


Fig. 4. Same patient as Figure 3. Second lasing, A) before and B) after.

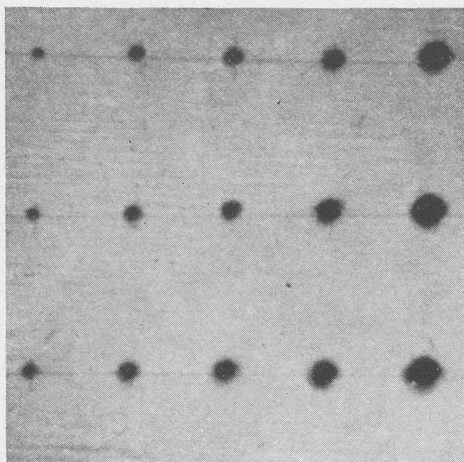


Fig. 5. Asbestos block lasing. Horizontal rows from top to bottom 0.22, 0.5 and 1.0 seconds. Vertical rows from left to right: 1, 5, 4, 8, 16 and 40 watts of power across lasing chamber.

Charring of the lased tissue may occur. This is reduced by increasing the power rather than increasing the duration of each exposure. Continued lasing of a charred area blocks the destructive process and, at least theoretically, results in overheating with increased tissue damage beyond the burned area. The char is removed by the open end laryngeal aspirator or by wiping with a sponge on a carrier.

Area of Destruction. The area of the

burn is about 2 mm in diameter, increasing slightly with an increase in duration of exposure and with increasing power (Fig. 5). Therefore, when only the smallest area of destruction is desired, the lasing is done at the lowest power and shortest time duration. The aiming light is adjusted prior to the procedure using an asbestos block to make the aiming light hit at the very center of the burn. Occasionally, during the lasing it is noted that the beam is not on dead center of the burned area. Correction is then made for this displacement of the beam. In fact, being a little off is sometimes helpful because the tissue cannot be seen exactly through the aiming spot. Another factor that must be recognized is that the beam can be reflected from the side of the laryngoscope onto the tissues and can produce a burn. On several occasions, when we have been lasing close to the anterior margin of the laryngoscope, there was a sudden shift of the burned area posteriorly. This was because the beam hit the laryngoscope and was reflected backwards away from the area that we expected to lase. This is corrected by lowering the height of the microscope and directing the optical pathway slightly anteriorly. This correction must be made very carefully because if it is too much, the beam will hit the proximal entrance of the laryngoscope and

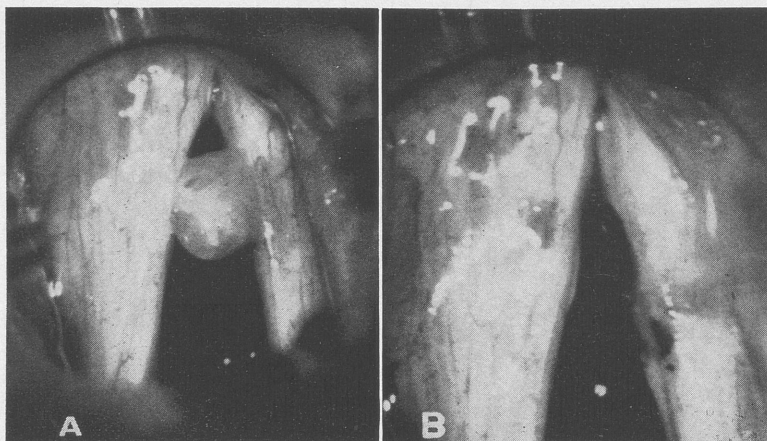


Fig. 6. Polyp in an adult, A) before and B) after lasing. The concavity at site of the lasing was caused by destruction of a tiny, firm mass within the vocal cord after lasing of the protruding mass.



Fig. 7. Polypoid degeneration bilaterally in adult, after lasing.

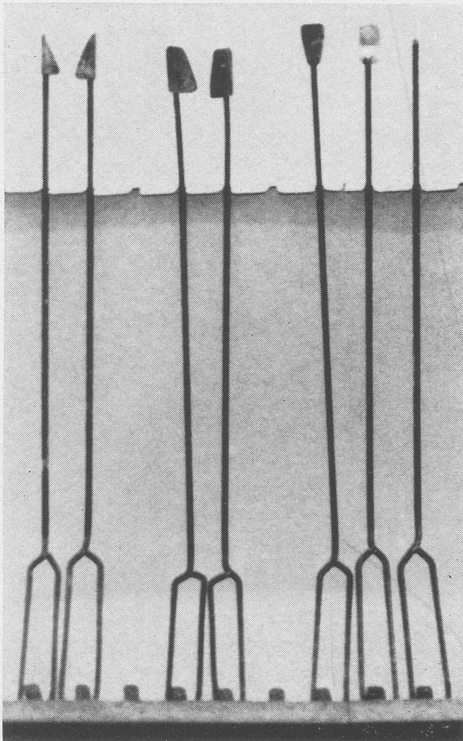


Fig. 8. The family of retractors and rack for manipulation of laryngeal tissue. The "Cologne" handles are light in weight and easily held.

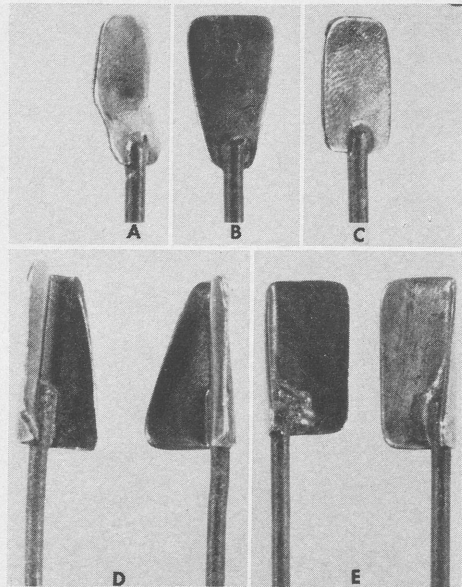


Fig. 9. Detail of retractors. A) Offset retractor; B) inverted spreader; C) flat retractor; D) right and left right-angle retractors; E) right and left catheter retractors with the medial plate curved to fit around the intratracheal catheter and the tapered plate displaces the arytenoid cartilage laterally.

not reach the tissues.

When it is desired to lase a very small area on the free edge of the vocal cord, only part of the beam can be used, the remainder passing downwards and being absorbed by the saline-moistened cottonoids. Even when the entire mass seems to be removed from the vocal cord in the case of a vocal nodule or polyp, palpation usually reveals a small firm mass within the vocal cord (Fig. 6). This tissue base is lased to disappearance with the added benefit of immediate hemostasis (Fig. 7).

In addition to the previously mentioned uses of the aspirator, it also removes the smoke and steam from the lasing process. For this purpose an aspirator may be clipped to the inside of the laryngoscope or, as we prefer, a velvet eye aspirator is inserted into the hypopharynx along the outside of the laryngoscope.

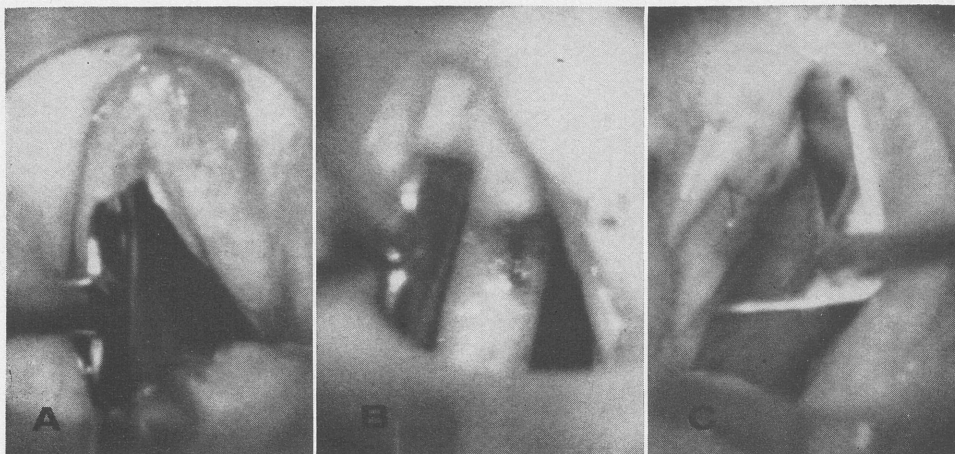


Fig. 10. A) Flat retractor pressing left vocal cord. B) Offset, flat retractor pressing left ventricular band laterally and rolling left vocal cord edge upward to present the partially lased polyp. C) Right angle retractor separating vocal cords to display the anterior commissure. The vertical plate of the retractor may be used to protect the anterior commissure and vocal cord from the laser beam.

Manipulation of the tissue of the larynx challenges the ingenuity of the operator in order to produce the best position for the lasing. Intralaryngeal retractors are useful, for example, for displacing a ventricular band. Aspirators may be used to pull tissue upward or medially in order to achieve the exposure. Pressure applied to a vocal cord with a closed forcep may roll or rotate it into an appropriate position.

We have been developing a family of instruments to assist in exposing pathologic tissues and at the same time protecting normal tissue (Fig. 8). These instruments consist of oblong retractors, offset retractors, right and left right-angle retractors, expandable retractors, and right and left catheter retractors (Fig. 9).

We have assumed that lasing of both cords at the anterior commissure will result in synechia. We therefore have gone to considerable effort to avoid lasing both vocal cords in this area. We have found the retractors to be of great value in opening and separating the cords anteriorly and at the same time

protecting the opposite vocal cord (Figs. 10A, B, and C).

When it is impossible to manipulate tissue into view so that it may be lased directly, the procedure may be done indirectly by the use of stainless steel or gold plated glass mirrors to reflect the beam to the hidden areas.⁸ With this combination of retractors and mirrors, practically any area of the larynx may be lased.

CONCLUSIONS

Our clinical experience with the laser loaned to us by the American Optical Corporation* was so favorable that we felt compelled to purchase a new model. This model is more convenient to use, has improved indication of the power and has more power than the older model.

The laser by its precision, absence of bleeding, control of depth and area of destruction, reduction of tissue reaction and preservation of normal tissue has extended the quality of our operative procedures. We even believe that our laser experience has made us more criti-

* Gas Laser Research, American Optical Corp., Framingham Center, Mass.

cal of and adept at conventional operative techniques.

Introduced is a family of laryngeal retractors which protect normal tissue

from and assist in exposing pathological tissue to the laser beam. Retractors and intralaryngeal mirrors make practically all areas of the larynx available for lasing.

DEPT. OF OTOLARYNGOLOGY, ABRAHAM LINCOLN SCHOOL OF MEDICINE, COLLEGE OF MEDICINE OF THE UNIVERSITY OF ILLINOIS AT THE MEDICAL CENTER, CHICAGO, ILLINOIS 60612.

ACKNOWLEDGMENTS—To the American Optical Corporation for the loan of the CO₂ laser and to Dr. Thomas G. Polanyi and Robert Wallace of the Gas Laser Research, American Optical Corporation for their cooperation and guidance in the use of the laser. We wish to thank Dr. Paul H. Holinger whose patients are included in the reported statistics and Dr. M. Stuart Strong whose generous coaching and moral support made it possible to move quickly from the animal studies to clinical use.

REFERENCES

1. Polanyi TG, Bredemeier HS, Davis TW, Jr.: A CO₂ laser for surgical research. *Med Biol Eng* 8:541, 1970
2. Strong MS, Jako GJ: Laser surgery in the larynx. *Ann Otol Rhinol Laryngol* 81:791, 1972
3. Leibowitz HM, Peacock GR: Corneal injury produced by carbon dioxide laser radiation. *Arch Ophthalmol* 81:713, 1969
4. Andrews AH, Goldenberg RA, Moss HW, et al: Carbon dioxide laser for laryngeal surgery. *Surg Annu* 1974 To be published
5. Shaker MH, Konchigeri HH: Anesthesia for intralaryngeal laser surgery. *Can Anaesth Soc J* To be published
6. Berenyi KJ, Harris RS, Harmel MH: General anesthesia for endoscopic operations. *Acta Anaesthesiol Scand (Suppl)* 23:529, 1966
7. Jako GJ: Laser surgery of the vocal cords. *Laryngoscope* 82:12, 2204, 1972
8. Strong MS, Jako GJ, Polanyi T, et al: Laser surgery in the aerodigestive tract. *Am J Surg* 126:529, 1973

DISCUSSION

M. STUART STRONG, M.D. (Boston, Mass.): I am indeed delighted to have this opportunity of discussing Dr. Andrew's presentation. Dr. Andrews is to be commended for having achieved so much experience in so short a time.

I have no criticism of anything he has said and I am pleased that he has explored this field with enthusiasm and appropriate caution. I would like to emphasize what he has said by making a few comments.

I find it difficult to advise the anesthesiologist to abandon the use of an intratracheal tube. With a direct line to the tracheobronchial tree I feel comfortable that the anesthesiologist can maintain oxygenation of the patient at all times.

Dr. Andrews and I have been aware that all of the available intratracheal tubes are heat labile and can be made to smolder in air and burn briskly in oxygen if exposed to several impacts of the laser beam. A temporary solution to this problem is to wrap the portion of the tube that will be situated in the larynx with a strip of self-adhesive aluminum. If the laser beam should strike the aluminum, it will be reflected as a divergent beam and produce no significant damage to the adjacent soft tissue or the underlying intratracheal tube. Teflon® is noncombustible but is an unsuitable

material for endotracheal tubes; the laser beam turns Teflon® into a cloud of white powder!

In an effort to find a permanent solution we have tried to develop a flexible, corrugated metal tube; there is still a problem with the design because of the weakness that exists in the wall of the tube at the junction of the corrugated portion and the smooth distal tip. Until a noncombustible tube is available, we must continue to be extremely careful during intralaryngeal surgery with the laser.

I was pleased that Dr. Andrews referred to the need to exercise caution at the anterior commissure. Dr. Jako's original dog experiments showed that it was difficult to avoid web formation if epithelium was removed with the laser from the anterior third of each cord. We have had this problem in several children with recurrent papillomas; overenthusiastic removal of tissue at the anterior commissure seems to be even more likely to be followed by web formation, if the child has a tracheostomy.

Dr. Andrews has made a particular contribution with the development of endolaryngeal retractors; these instruments will be most useful in protecting the anterior third of one cord from accidental injury during surgery on the other.

I would like to congratulate Dr. Andrews for having accomplished such significant work in such a short time. I feel quite confident that, with the benefit of his experience in addition to our own, laser surgery is a technique that has a future in our specialty as well as in others.

BLAIR FEARON, M.D.: A few years ago Pilling made a laryngoscope for us for micro-laryngoscopy that does have an anesthetic conductor on it. With it we do not need endotracheal tubes at any age (up to 18 that is). They work very nicely so we do not have the problem of the tube getting in our way.

ALBERT H. ANDREWS, JR., M.D. (Author's

response): As you can see, we are deeply indebted to Dr. Strong for the marvelous work that he has done. I would like to make one comment on the educational aspects of the CO₂ laser. When we first received it, one of our senior residents devoted his attention to this and worked with us very closely. During the second year, another senior resident, Dr. Moss, the co-author, worked with us.

Hereafter we intend to make the laser procedures the same as any other laryngeal procedure as far as assistance and cooperation with residents are concerned. We feel that laser surgery has advanced to the point where, in our training program, we can regard it as we would any other surgical procedure.

RECONSTRUCTION OF THE TONGUE

HUGH O. DEFRIES, M.D.

BETHESDA, MARYLAND

SUMMARY — Total or subtotal glossectomy for carcinomas of the tongue results in severe dysfunction of speech and swallowing. In such cases the larynx is frequently removed to prevent aspiration. In our experience the larynx may be preserved and intelligible speech and swallowing, without aspiration, may be achieved. Two patients were rehabilitated following total glossectomy by means of a tongue prosthesis. In two other patients in whom over one-half of the anterior tongue was removed the tongue was reconstructed by means of a deltopectoral flap.

Surgical treatment for those carcinomas of the tongue which are confined to its lateral surfaces and do not approach the midline is usually limited to lateral partial glossectomy or hemiglossectomy with or without neck dissection.¹ Such treatment may be preceded by varying degrees of radiation therapy. Function of the tongue following such therapy is usually adequate for speech and deglutition. This is particularly true if side to side closure of the operative defect with the cheek or gingiva is avoided. When a forehead flap, tongue flap, or split thickness skin graft is used to form a new lingual sulcus laterally, mobility is usually provided to the remaining tongue.

Certain patients with lesions of the anterior tongue that either reach to or cross the midline can be treated by transverse partial or subtotal glossectomy. A very small group of patients with advanced lesions of the tongue may be managed by total glossectomy.² However, these patients are invariably left with a severe crippling deformity which makes speech and deglutition impossible. As a consequence, a total laryngectomy is often considered necessary to spare the patient from the con-

stant threat of aspiration and its sequelae.³

The purpose of this communication is to review our experience at the National Naval Medical Center in the rehabilitation of patients who have undergone total or subtotal glossectomy. Patients undergoing radical removal of the tongue or floor of mouth can be adequately rehabilitated. In two of our patients in whom total glossectomy was performed, the larynx was preserved. In both of the patients the use of a tongue prosthesis made comfortable swallowing and intelligible speech possible. A previous report has been made by Moore⁴ concerning the technique of construction of such a prosthesis in the first of our patients. In one patient in whom transverse partial glossectomy and mandibulectomy were required, deglutition and articulate, intelligible speech were restored by surgery. A deltopectoral flap was used to reconstruct the anterior tongue and floor of mouth. The anterior mandible was reconstructed by combined homograft-autograft. In a second similar patient, the anterior tongue and floor of mouth were reconstructed in a like manner. As of the present date, this patient is await-

From the National Naval Medical Center, Bethesda, Maryland.

The opinions and assertions contained herein are those of the author and are not to be construed as official or as reflecting the views of the Navy Department or the Naval Service at large.

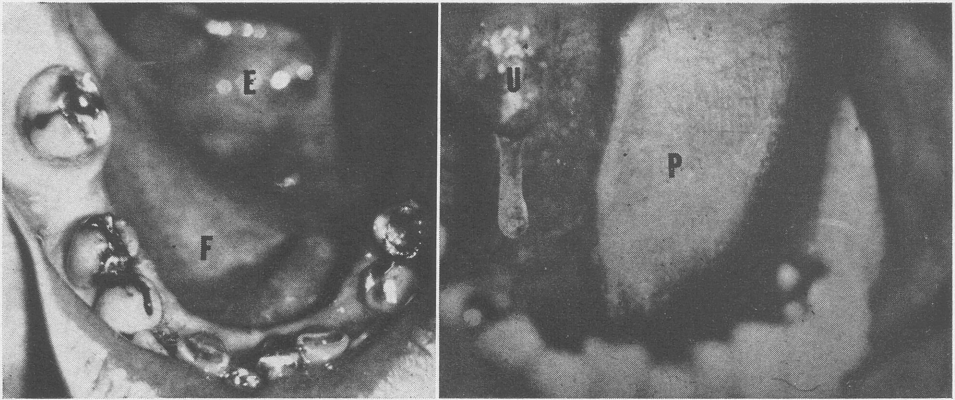


Fig. 1. View of the interior of the mouth showing absence of the tongue. The floor of the mouth (F) has been reconstructed by a deltopectoral flap. Note the epiglottis (E) in the background.

Fig. 2. View of the interior of the mouth showing reconstruction of the lateral pharynx (P) by the deltopectoral flap. Uvula (U) can be seen adjacent.

ing further reconstruction of the mandible.

CASE REPORTS

Case 1. A 58-year-old white male was admitted to the hospital for treatment of a large carcinoma of the base of the tongue extending to the left floor of mouth, tonsillar fossa and lateral pharynx. A resection of the entire tongue, the left floor of mouth, lateral pharynx, and left posterior body and angle of the mandible was performed in continuity with a left radical neck dissection. The pharynx and floor of mouth were reconstructed by a tubed deltopectoral flap at the time of surgery. The larynx was uninvolved by tumor and was not removed (Figs. 1 and 2).

Healing was uneventful but it was necessary to maintain a tracheostomy with a low pressure cuffed tube during the first six weeks following surgery to prevent aspiration of saliva.

After complete healing the patient was fitted with a tongue prosthesis, which was constructed in two parts. The first part, affixed to the remaining teeth by clasps, filled in the bulk of the floor of the mouth and the area formerly occupied by the base of the tongue. The second part was made of pliable silicone rubber and was attached to the first

part by a flexible "collar button" type attachment. This latter portion was shaped in the form of the anterior two-thirds of the tongue in the swallowing position and could be moved by pressure against the hard palate upon movement of the mandible (Figs. 3 and 4).

After a short period of adaptation, the patient was capable of eating soft foods and swallowing liquids without aspiration. Speech was markedly improved and became progressively more intelligible. The tracheostomy was closed and the patient has been able to return to normal activity maintaining normal weight by an adequate diet.

Case 2. A 54-year-old white male was admitted to the hospital two years following treatment for a large carcinoma of the anterior floor of the mouth and anterior one-third of the tongue. The patient had undergone resection of the anterior one-half of the tongue, the anterior floor of the mouth, and a large portion of the anterior mandible. A left radical neck dissection and a right modified radical neck dissection had been performed in continuity with the resection of the primary tumor. The surgical defect in the mouth had been closed primarily.

Physical examination on admission revealed that the patient was well healed

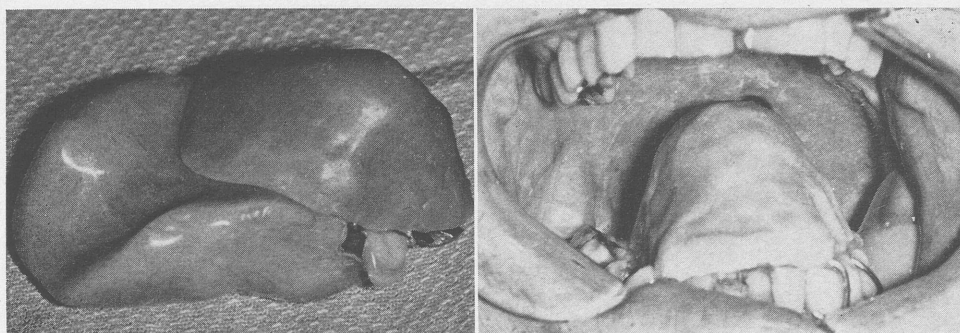


Fig. 3. The tongue prosthesis was used as shown in this patient. The lower portion is affixed to the remaining teeth by clasps and is removable. The upper portion is made in the shape of the tongue in the swallowing position and may be removed separately. The upper part, made of pliable silicone rubber, is slightly mobile on its base when pressed against the hard palate by mandibular movement. Illustration furnished by D. J. Moore.⁴

Fig. 4. View showing the prosthesis in place. Note how much of the potential intraoral space is filled by the appliance.

with no evidence of recurrent cancer. There was marked retrusion of the chin and lower lip. It was evident that the base of the tongue was capable of movement but immobilized by the closure (Fig. 5). The patient was able to feed himself liquids by means of an oral-pharyngeal tube introduced at each feeding. The remainder of the physical findings and laboratory studies were normal.

A decision was made to reconstruct the anterior one-half of the tongue. A right deltopectoral flap was elevated,

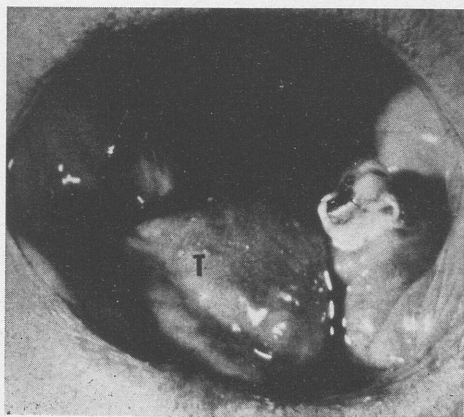


Fig. 5. Intraoral view of the second patient. Note how the remaining posterior one-half of the tongue (T) is immobilized in the floor of the mouth by the original closure.

tubed, and delayed. Three weeks later the lateral end of the tube was released and attached to the mobilized remaining posterior one-half of the tongue through a lip splitting incision (Fig. 6).

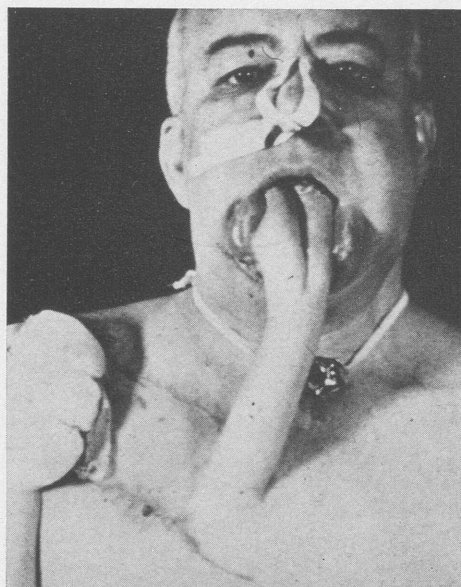


Fig. 6. View showing transfer of deltopectoral flap to the tongue and the gingiva of the right mandibular stump through a lip splitting incision. Note the sulcus between the portion attached to the tongue and that portion attached to the gingiva. The portion attached to the gingiva will be used to reconstruct the anterior floor of the mouth.

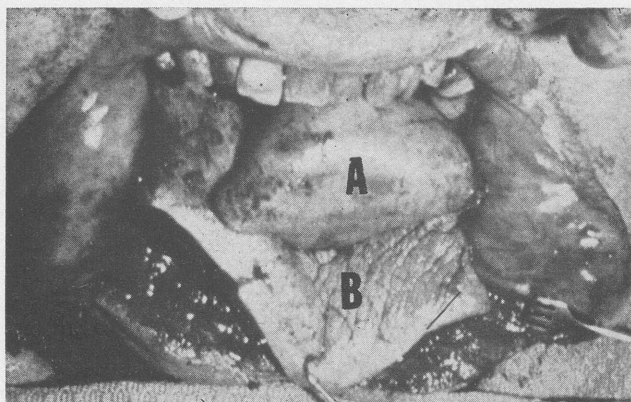


Fig. 7. View showing reconstruction of the tongue and anterior floor of the mouth. The portion of the deltopectoral flap (A) attached to the remaining tongue has been divided from the lateral portion anteriorly and folded on itself. The portion (B) attached to the right mandibular gingiva has been brought across under the tip of the reconstructed tongue to cover the floor of the mouth anteriorly and to provide coverage for a future mandibular bone graft.

After five weeks the flap was divided and a large portion which remained attached to the tongue was fashioned into a new anterior one-half of tongue and anterior floor of mouth (Fig. 7). The patient healed without incident and was subsequently able to swallow liquids without a tube, and his speech was greatly improved.

Six months later the patient was readmitted and underwent reconstruction of the anterior mandible with a combined mandibular homograft-autograft.⁵ Healing was uneventful and further improvement in speech and deglutition has been evident.

DISCUSSION

The tongue plays an essential role in deglutition by progressively obliterating all potential space from anteriorly to posteriorly and inferiorly and propelling the food bolus into the hypopharynx. Contraction of the cheeks, pharynx, and hypopharynx augments this process.

During the act of swallowing, the airway is protected by elevation of the larynx closure of the glottis and the deflection of the food bolus by the epiglottis into the hypopharynx. Relaxation of the cricopharyngeus muscle allows passage of the bolus into the esophagus.

However, if such passage is delayed, the bolus pools in the hypopharynx. With reopening of the glottic sphincters, aspiration invariably occurs. Such delay can be caused by paralysis of the pharyngeal constrictors⁶ and inadequate relaxation of the cricopharyngeus muscle.⁷ Moreover, absence of large portions of the tongue can create significant unclosed oropharyngeal spaces and interferes with positive propulsion downward of any ingested food.

When large portions of the anterior tongue are removed transversely, the tip of the tongue is lost and the remainder of the tongue becomes relatively immobilized. Speech is thus severely impaired.

Typical lesions necessitating partial transverse glossectomy of either the anterior third or one-half of the tongue include advanced lesions of the anterior tongue which have crossed the midline or advanced lesions of the anterior floor of the mouth involving the ventral surface of the tip of the tongue. In such lesions it is frequently possible to obtain adequate margins of resection around the involved portion of the tongue and still preserve the posterior one-third to one-half of the tongue with preservation of an adequate unilateral

or bilateral motor nerve supply. Primary closure of such a surgical defect or augmentation and closure with a forehead flap is possible but leaves the patient with marked loss of bulk of the tongue within the oral cavity.^{8,9} Such loss of bulk creates a dead space which makes swallowing difficult and intelligible speech impossible. However, the possibility of aspiration is not as great, since propulsive force in the hypopharynx is still possible. Physiologic disturbance is more compounded in those patients with advanced floor of mouth lesions which necessitate removal of significant portions of the anterior mandible.

It should be stressed that advanced carcinomas of the tongue which involve the base or middle third frequently cross the midline. Such lesions not uncommonly invade the hypoglossal nerves and produce total or partial paralysis of the tongue. The apparent ease with which such tumors spread between the muscle fibers of the tongue makes adequate margins of resection uncertain unless a total glossectomy or subtotal glossectomy is performed.

Such resections, frequently in continuity with portions of the pharynx, floor of mouth, and mandible, may be adequate to remove the primary tumor. Although external anatomic and cosmetic deformity may be only slight, the pa-

tient is left with severe physiologic dysfunction. Such patients may be unable to speak or to swallow. If the larynx has not been removed, the patient is often in danger of aspiration of oral secretions or vomitus, as well as ingested food and liquids. Thus, even though not invaded by tumor the larynx is frequently removed with lesions requiring total glossectomy.

Our present experiences in managing patients with carcinoma of the tongue have brought us to the following conclusions:

1. In patients requiring total glossectomy the larynx can be preserved, provided it is uninvolved by tumor.
2. After total glossectomy a patient may be fitted with a tongue prosthesis which will enable him to speak and to swallow without aspiration.
3. When large portions of the anterior tongue, including the tip, are excised the tongue may be reconstructed by a deltopectoral flap. Such reconstruction results in improved speech and deglutition.
4. If significant portions of the anterior mandible have been removed, reconstruction of the mandible results in further improvement of speech and deglutition. Such reconstruction can be achieved by the use of a combined mandibular homograft-autograft.

DEPT. OF OTOLARYNGOLOGY, NATIONAL NAVAL MEDICAL CENTER, BETHESDA, MARYLAND 20014.

REFERENCES

1. Southwick HW: Cancer of the tongue. *Surg Clin North Am* 53:147-148, 1973
2. Myers EN: The role of total glossectomy in the management of cancer of the oral cavity. *Otolaryngol Clin North Am* 5:343-355, 1972
3. Sessions DG, Stallings JO: Total glossectomy for advanced carcinoma of the base of the tongue. *Laryngoscope* 83:39-50, 1973
4. Moore DJ: Glossectomy rehabilitation by mandibular tongue prosthesis. *J Prosthet Dent* 28:429-433, 1972
5. deFries HO, Marble HB, Sell KW: Reconstruction of the mandible. *Arch Otolaryngol* 93:426-432, 1971
6. Zehm S: Functional restitution of the denervated gullet. *Arch Otolaryngol*, (in press)
7. Ogura JH, Salzstein SL, Spjut HJ: Experiences with conservation surgery in laryngeal and pharyngeal carcinoma. *Laryngoscope* 71:258-276, 1967
8. Terz JJ, King RE: Primary rehabilitation after total glossectomy and laryngectomy with mandibulectomy for advanced cancer of the mouth. *Surg Gynecol Obstet* 136:276-278, 1973
9. Myers EN: Reconstruction of the oral cavity. *Otolaryngol Clin North Am* 5:413-433, 1972

TOTAL RECONSTRUCTION OF THE HYPOPHARYNX WITH TONGUE FLAP AND DERMAL GRAFT

JOHN M. LORÉ, JR., M.D.

BUFFALO, NEW YORK

SUMMARY—A one stage procedure utilizing a posterior tongue flap and dermal graft for reconstruction of the hypopharynx following total laryngopharyngectomy is described. The operation has been performed upon four patients, with satisfactory to excellent results as far as deglutition is concerned: one patient had some dysphagia initially, was dilated and then progressed to excellent deglutition; two patients with satisfactory to excellent deglutition: one patient with excellent deglutition initially, but finally developed a stricture, which has been treated with dilatation with satisfactory results. Follow-up reveals: one patient is alive and well two years and four months; another patient is alive with recurrent disease in the contralateral neck, while two patients have expired 22½ months and seven months, without evidence of local disease.

Following total laryngopharyngectomy, when the entire circumferential portion of the hypopharynx is resected, a number of reconstructive procedures are available to reconstitute the conduit from the oral cavity to the esophagus. Although versatility is admirable, the sheer number of techniques indicates that no one procedure is entirely satisfactory. Free grafts of epidermis or dermis tend to contract; skin flaps usually necessitate a second stage to close the planned fistula; the use of transposed bowel is an involved procedure.

Sisson¹ and Hiranandani² independently have described posterior tongue flaps to reconstruct the anterior wall of the hypopharynx following laryngectomy and partial hypopharyngectomy.

The procedure herein detailed is a one-stage method, utilizing a sliding advanced posterior tongue flap to form the anterior and lateral walls of the new conduit with a dermal graft to form the posterior wall. This reconstructive procedure has been performed on four patients following total laryngopharyngectomy for Stage III and Stage IV

squamous cell carcinoma of the larynx and pharynx. In addition, the palatine tonsil was involved in one patient. All four patients have had the entire circumferential wall of the hypopharynx removed, along with a total laryngectomy and radical neck dissection. One patient had preoperative radiotherapy consisting of 4500 rads of mega voltage which did not interfere with wound healing. There has been primary wound healing in three patients; one patient, however, did have a small wound abscess with evidence of an infinitesimal leak following the ingestion of methylene blue. This closed spontaneously after drainage of the abscess. Postoperatively, deglutition in the four patients ranged from satisfactory to excellent. Specifically, the results of each patient are as follows:

CASE REPORTS

Case 1. F.S., a 69-year-old white female. Immediately postoperatively, this patient had intermittent difficulty in initiating deglutition. After three months, swallowing became excellent following two dilatations. Figure 1



Fig. 1. Case 1, F.S. Demonstrates postoperative barium swallow.

demonstrates a barium swallow after the operative procedure. She expired 22½ months postoperative of metastatic mediastinal squamous cell carcinoma. There was no evidence of local recurrent disease. Dermal graft had assumed the gross characteristic of relatively normal appearing mucosa.

Case 2. C.W., a 75-year-old white male. Deglutition postoperatively ranged from satisfactory to good. Figure 2 demonstrates the barium swallow following the reconstructive surgical procedure. This patient is alive and well, two years and four months postoperative.

Case 3. W.H., a 75-year-old white male. The patient has had good to ex-

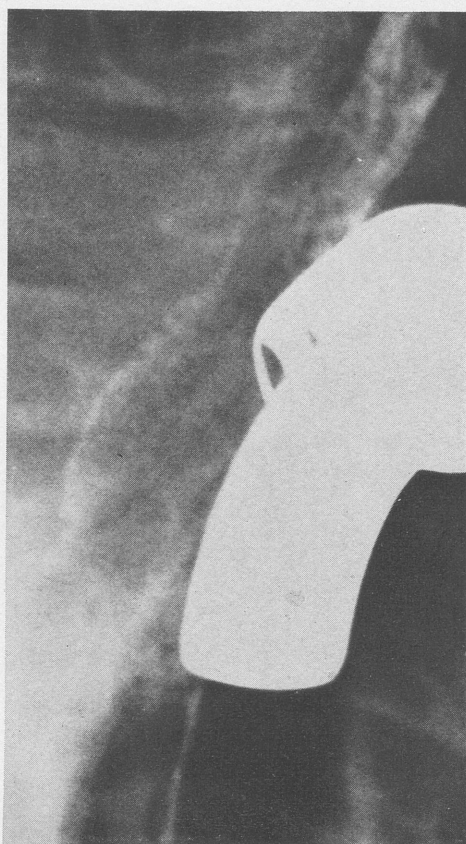


Fig. 2. Case 2, C.W. Demonstrates barium swallow following reconstructive surgery.

cellent deglutition as demonstrated in barium swallow in Figure 3. He expired seven months postoperative, with a clinical diagnosis of pneumonia. A necropsy was not obtained; however, there was no clinical evidence of recurrent carcinoma.

Case 4. J.S., a 49-year-old black male. This patient developed a small wound abscess with an infinitesimal leak at the distal anastomosis as demonstrated by methylene blue. There was no leak of food. The leak healed spontaneously following drainage of the abscess. Initially, deglutition was good to excellent, as demonstrated in the barium swallow in Figure 4. However, three months postoperative he developed metastatic disease in the contralateral neck and

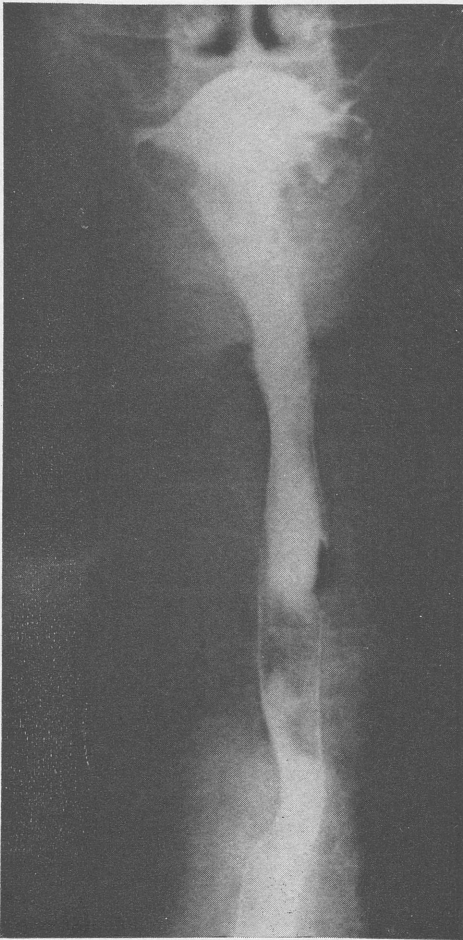


Fig. 3. Case 3, W.H. Patient has good to excellent deglutition as demonstrated in barium swallow.

dysphagia for solid foods, secondary to a stricture at the distal suture line where the dermal graft and tongue flap were anastomosed to the esophagus. This site corresponded to the location of the previously noted wound abscess. Esophagoscopy revealed scar tissue and granulation tissue upon biopsy. The stricture was dilated with satisfactory results and a contralateral radical neck dissection performed. Two months later he developed recurrent disease in the contralateral neck.

One limiting factor of this reconstructive procedure is resection of more than one to two cm at the base of the tongue.



Fig. 4. Case 4, J.S. Demonstrates initial good to excellent deglutition.

This loss of tongue would preclude the use of this technique, since adequate length of the tongue flap may not be obtainable. This has occurred in one patient, necessitating the use of a deltopectoral flap for reconstruction requiring a two-stage operation. In no case should the ablative surgery be limited to accommodate the reconstructive procedure.

OUTLINE OF TECHNIQUE

1. Defect closed can be up to 8 cm in length.
2. Liberal mobilization of oropharynx and esophagus. Flexion of head and neck aids in reducing tension on the anterior suture lines if necessary.
3. Suture all mobilized oropharyngeal and esophageal mucosa and underlying muscle to prevertebral fascia and the

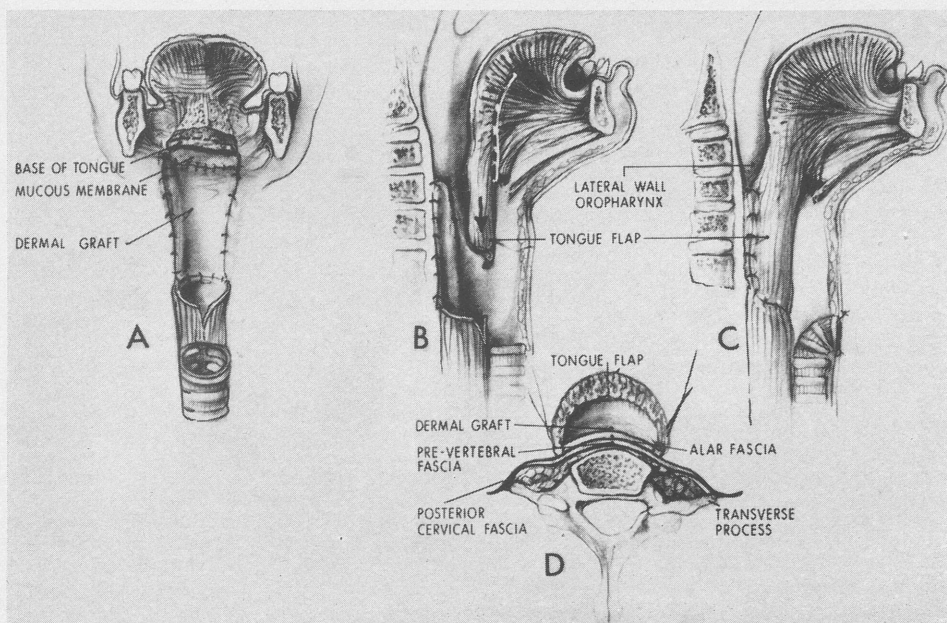


Fig. 5. A) The oropharynx and esophagus have been mobilized and their free edges have been sutured to the prevertebral fascia and the anterior spinal ligament along with the superior and inferior borders of the dermal graft. This fixes these structures and minimizes the tension on the mucosa to dermal graft sutures. The dermal graft is also sutured posterolaterally to the prevertebral fascia and the upper and lower ends sutured to the mucosa of the oropharynx and esophagus. The anterior wall of the esophagus is split vertically in the midline for a distance of one or two cm to enlarge its lumen. The horizontal dotted line across the base of the tongue indicates the incision to form the tongue flap 1.0 cm to 1.5 cm in thickness which includes the mucosa of the tongue.³ B) Lateral view depicts mobilization of tongue flap. This mobilization extends anterior to the circumvallae papillae, preserving however, the lateral mucosal folds of the tongue. The base is anterior. C) The tongue flap has been tubed about 270° to form the anterior and lateral walls of the newly constructed gullet. The tongue flap is not only sutured to the dermal graft but also to the esophagus with through and through sutures using either interrupted or continuous Connell sutures. If continuous are used, it is best that they be in two sections, right and left, to avoid a purse string effect and hereby narrow the lumen. The midportion of the distal end of the tongue flap is sutured to the apex of the "V" incision in the esophagus to widen the lumen. A second layer of three interrupted sutures through esophageal and tongue musculature may be used for reinforcement, although the initial mucosa to mucosa sutures are by far the more important. Tension is to be avoided. D) Cross section through the new gullet demonstrates the tongue flap forming the anterior and lateral walls and the dermal graft forming the posterior wall. The so called prevertebral fascia is actually the posterior cervical fascia made up of two layers: the alar fascia and the true prevertebral fascia being separated by loose connective tissue.⁴ Each layer is attached to the ends of the transverse processes of the vertebrae. Deep to this fascia is the anterior spinal ligament.

anterior spinal ligament. This avoids tension on mucosal suture lines.

4. Suture dermal graft to prevertebral fascia and the anterior spinal ligament. This forms posterior wall of the new gullet.

5. Tongue flap is a sliding advanced flap with the base anteriorly and forms

the anterior and lateral walls of the new gullet.

6. Vertical incision in esophagus to widen lumen at the anastomotic suture line.

7. Radical neck dissection is easily combined with resection in the standard method.

REFERENCES

1. Sisson GA: Reconstruction of the hypopharynx and cervical esophagus after radical excisional surgery. *Laryngoscope* 66:1268-1290, 1956
2. Hiranandani LH: Tongue and pedicle flap for reconstruction of pharynx in one-stage laryngopharyngectomy. *Rev Laryngol Otol Rhinol (Bord)* 1-2: January-February, 1967
3. Loré JM, Jr: *Atlas of Head and Neck Surgery*, ed 2. Philadelphia, WB Saunders Company, 1973
4. Hollinshead WH: *Anatomy for Surgeons: Volume 1, The Head and Neck*, New York, Harper and Row Publishers, 1968

LARYNGOTRACHEAL AUTOGRAFT FOR POSTCRICOID CARCINOMA

A REEVALUATION

MAX L. SOM, M.D.

NEW YORK, NEW YORK

SUMMARY — Of 84 surgically treated cases of postcricoid carcinoma, 23 had a pharynx-esophageal reconstruction by use of a laryngotracheal autograft. This procedure is most suitable in females with manifestations of the Paterson-Brown-Kelly syndrome. The distal esophagus is not "at risk" because of skip areas or second primary lesions. Failures are due predominantly to inability to control the lymphatic metastasis. Stomal recurrence may be due to ascending metastasis from the tracheoesophageal groove and mediastinum. A routine combined neck dissection is urged in all instances. Mediastinal node extirpation with or without resection of the manubrium may increase survival rate. Adequate surgical exposure with visualization, palpation, and exploration of the extent of the cancer is suggested prior to determination of the method of reconstruction of the pharyngoesophagus. In selected cases without previous radiotherapy the laryngotracheal autograft has proved satisfactory.

The use of the larynx and upper trachea to reconstitute the pharyngoesophagus was first described by Asherson¹ and later by Wilkins² in 1954. This procedure preserved the posterior tracheal or common party wall as part of the conduit. Such limited resection is totally inadequate in the surgical treatment of constricting lesions of the postcricoid region.

A detailed study of the surgical specimens excised by total laryngopharyngoesophagectomy as in the Wookey,³ Bakamjian⁴ and similar extirpative procedures revealed a diffuse involvement of the entire mucosal circumference of the pharynx at the cricopharyngeal region. While infiltration of the rostrum of the cricoid was frequently encountered, the endolaryngeal mucosa of the cricoid was most often not involved and the anterior half of the larynx and upper tracheal rings were spared. The common party wall was invaded in about 50% of the cases.

In selected instances wide resection of the tumor could be accomplished, including the entire circumference of the postcricoid region in continuity with the posterior half of the larynx and the upper tracheal rings. The semicircular cartilaginous structures of the larynx and trachea with their intervening mucosa and mucoperichondria could be preserved as a laryngotracheal autograft, to form the anterior half of the newly created pharyngoesophagus. The posterior half of this conduit is formed by a split thickness skin graft resting on the vertebral fascia and sutured to the margins of the laryngotracheal autograft laterally. A Negus mold is used for support and immobilization and care is taken to preserve the superior laryngeal vessels.

In 1956, this procedure of laryngotracheal autograft was initially reported.⁵ Since then twenty-three selected instances of limited postcricoid carcinoma were treated in this manner.

From the Department of Otolaryngology, Mount Sinai School of Medicine, New York City, New York.



Fig. 1. Upper G.I. study showing arrest of a 12 mm barium pill above the level of the cricopharyngeus muscle. Thin barium goes into esophagus, but the pill is held up until it disintegrates.

This discussion is limited to stenosing carcinoma of the postcricoid division of the hypopharynx and does not include extensive pyriform lesions encroaching upon and producing stenosis of the cricopharyngeal area. Lesions which are primarily in the cervical esophagus and extend cephalad to involve the postcricoid region are also excluded.

Most cases of postcricoid cancer are far advanced and extensive when first diagnosed. The patient rarely seeks advice until obstruction of swallowing is so severe as to be alarming. It is frequently not possible to determine clinically the extent of penetration of the surrounding tissues and an erroneous impression, minimizing the degree of involvement, is not unusual.



Fig. 2. Exposure of the postcricoid tumor after performance of radical neck dissection. The cancer can be seen, isolated and palpated to determine operability and method of reconstruction.

The upper extent of the tumor can be determined by mirror examination, direct hypopharyngoscopy and palpation. Freedom of involvement of the endolarynx and trachea can be ascertained by endoscopy.

The lower extent of the cancer and the degree of esophageal infiltration is difficult to evaluate. Most often, the stenosing lesion at the mouth of the esophagus will not permit the introduction of a rigid endoscopic tube and hence the lower margin of involvement remains uncertain. Some help can be gained by roentgenography with a thin barium mixture. In all cases, a 12 mm barium pill will be arrested at the stenotic segment (Fig. 1). If the patient is made to swallow the contrast media in the Trendelenburg position, the lower border of the tumor can often be visualized with some degree of accuracy. The introduction of a narrow bougie through the stenotic tumor into the distal esophagus is often possible. Upon withdrawal of the bougie the point of obstruction might be determined and measured from the upper

incisor teeth. In this manner an educated guess of the lower limit can be made. If the stenosis is not complete a bronchoscope can be inserted into the esophagus just beyond the obstruction. A fibroptic bronchoscope may also be introduced to permit visualization and photography of the lower extent of the cancer.

In the final analysis, exposure of the tumor (Fig. 2) in the pharynoesophagus at time of surgery is the deciding factor as to the extent of excision required and the type of reconstruction which can be used. Visualization, isolation and palpation of the cancer is the best guide as to the limits of cancerous invasion. No one method of extirpation and repair is suitable for all cases and the reconstruction can be tailored to the specific need. Using the above criteria for determining the extent of the postcricoid cancer the following operative procedures have been done since 1955 (Table I).

TABLE I
OPERATIVE PROCEDURES

<i>Methods of Reconstruction</i>	<i>No. of Patients</i>
I. Use of local skin flaps	
A. Wookey procedure	23
B. Medial based chest flap	10
C. Bilateral laterally based chest flap	1
D. Occipito cervical flap	1
II. Primary reconstruction with split thickness skin graft "Negus, Conley"	3
III. Revascularized jejunal segment	6
IV. Reversed gastric tube "Heimlich"	4
V. Colonic interposition	3
VI. Pharyngolaryngoesophagectomy "Harrison"	10
VII. Laryngotracheal autograft	23
Laryngotracheal Autograft Used in 27% of Total	84

It is apparent from Table I that the use of the laryngotracheal autograft was confined to certain select cases: 23 of 84, or 27%. It is certainly not the opera-

tion of choice except in such limited lesions.

The instances in which this one-stage procedure is eminently suitable are those postcricoid cancers in the female engrafted on a previously existing Plummer-Vinson or Paterson-Brown-Kelly syndrome. This condition, while not very prevalent, is not too uncommon and seems to persist despite efficient iron therapy. Hoeksema⁶ recently reported that of 18 patients younger than 50 with carcinoma of postcricoid region, 13 were females with manifestations of Paterson-Brown-Kelly syndrome. To the extent that similar early lesions of the postcricoid region occasionally are diagnosed in the male, the laryngotracheal autograft is also feasible.

The use of laryngotracheal autograft, with slight modifications, has been reported by Simpson,⁷ Femenic and Subotic,⁸ Denecke,⁹ Ogura and Biller.¹⁰

ANALYSIS OF 23 CASES TREATED WITH
LARYNGOTRACHEAL AUTOGRAFTS

There were 18 females and five males and the ages varied from 42-66 years. Ten had palpable cervical nodes on admission and three had occult microscopically positive metastatic nodes. Except in two instances a simultaneous radical neck dissection was performed. On five occasions a bilateral neck dissection was done with preservation of the internal jugular vein on the side of lesser involvement. When metastatic nodes were found at the initial radical neck a staged contralateral neck dissection was done five to six weeks later.

Of the 23 surgically treated cases, there are six survivors: five females and one male over five years. The causes of death in the remaining 17 cases are shown in Table II.

It is apparent that failure lies predominantly in the inadequate management of the lymphatic metastases. It is a clinically established fact that ascending lymphatic channels from the pharynx terminate in the retropharyngeal lymph nodes. It is possible that one of the three local recurrences in the

TABLE II
CAUSES OF DEATH

	<i>No. of Patients</i>
Local recurrence in the pharynx	3
Stomal recurrence	2
Operative mortality	1
Recurrent cervical and mediastinal nodes	10
Distant metastases without evidence of persistent cervical disease	1
	17

pharynx may not necessarily be due to persistent local disease above the upper limit of resection, but could conceivably be the result of metastatic nodes extending submucosally.

The predominant lymphatic drainage from the postcricoid region is into the deep cervical and paratracheal nodes. It is the persistence or recurrence of metastases in these regions which are responsible for failure in the great majority of cases.

In an earlier publication¹¹ it was pointed out that in some cases the initial sign of recurrence was the appearance of a subcutaneous firm nodule around the tracheal stoma impinging upon its lumen. These tumors were first thought to be manifestations of a local recurrence or persistence of neoplasm at the lower suture line, in spite of the fact that in all the surgical specimens the lower margin of the resection was microscopically free of tumors. In those instances where surgical exploration and palpation of the tumor showed involvement of the esophagus beyond the scope compatible with reconstruction by laryngotracheal autograft, another method of excision and reconstruction, i.e., Bakamjian flap or bowel interposition, was employed. Postmortem examination in one instance revealed that the stomal masses proved to be metastatic lymph nodes in the tracheoesophageal interspace extending upward from the mediastinum. Such metastatic spread on either side of the trachea is indeed common. The cause of failure proved

to be more often the result of cervical and mediastinal metastasis than of local recurrence.

The concept that skip areas existed in the distal esophagus was heretofore prevalent. It was assumed that multiple primary tumors in the esophagus were common and could account for the failures. These are not the facts as borne out in this series.

Actually, of the 84 cases of postcricoid carcinoma which came to surgery, there was but one instance of a demonstrable second primary tumor at a 4 cm distance from the known tumor (Fig. 3).



Fig. 3. The single instance of second primary cancer in this series. This independent tumor was detected about four cm below the known postcricoid carcinoma.

Harrison¹² reported extensive meticulous studies of serial sections of the entire surgical specimens including the larynx, pharynx and entire esophagus. Of 20 patients with pharyngolaryngoesophagectomy, serial sections in the Harrison series showed no evidence of

a second primary, in even one instance. Oloffson¹³ and Harrison¹² state that the average submucosal extension for lesions of the postericoid region is five mm. In none of our surgical specimens was the tumor demonstrably less than one cm from the resected distal margin. Stuart,¹⁴ who employs silastic tubes, recently emphasized that the lower esophagus was not "at risk" in adequate excision of the tumor.

Recurrence of disease has in this series of laryngotracheal autografts seldom taken place in the reconstructed gullet. Recurrent metastatic nodes rarely appeared on the side where a combined neck dissection has been performed.

In an attempt to more thoroughly treat the major cause of failures, namely cervical and mediastinal node metastasis, routine neck dissection was recommended in 1961.¹¹ In addition, resection of the mediastinal lymph nodes was then suggested. In some individuals with long necks the resection of the lymph nodes in the paratracheal region and mediastinum could be accomplished by maximum cervical extension. In others a mediastinal split was recommended for complete exenteration of the mediastinal nodes, including the thymus. Harrison¹⁵ has since suggested resection of the manubrium and the clavicular heads for better exposure. This procedure permits exteriorization of the permanent tracheostome at a much lower level. A more liberal resection of the trachea in continuity with the tumor is thus rendered possible.

The resection of the manubrium is not a hazardous procedure and may be very rewarding.¹⁶ In this series of 23 cases, a manubrial split with mediastinal node dissection was done five times. Metastatic nodes were extirpated on three occasions and one of the six survivors had a histologically positive mediastinal node. It seems unlikely that a cure would have been obtained in this patient were it not for the excision of the metastatic mediastinal node.

Of the six survivors all had at least one unilateral radical neck dissection

and two had bilateral staged neck dissections.

DISCUSSION

The laryngotracheal autograft is a suitable one-stage procedure for the reconstruction of the pharyngoesophagus after excision of selected limited post-cricoid lesions. This is especially applicable to females with existing Pater-son-Brown-Kelly syndrome. Patients who have previously received a cancericidal dose of supravoltage therapy are not suitable. In two such instances, the autograft partially sloughed and tracheal cartilages became exposed. One of these patients was the sole operative mortality.

The average hospital stay was three to six weeks, and deglutition was achieved at the end of two to three weeks. One patient required dilatation every two to three months over a period of ten years. Stenosis was not a problem in the remaining survivors. The posterior skin graft partially disintegrated in one instance but spontaneous closure without stenosis eventually occurred.

It would appear that a more energetic surgical approach to the eradication of existent palpable and occult cervical mediastinal metastasis could possibly increase survival. It is suggested that a unilateral neck dissection should always be performed in continuity. In the absence of palpable nodes, the choice of the side for surgery is the option of the surgeon. If the existence of cervical metastasis is demonstrated, a contralateral stage radical dissection is imperative. Exploration of the tracheoesophageal recess and the superior mediastinum is routinely indicated and resection of any palpable nodes with or without manubrial resection could enhance survival.

The all important factor in the choice of the laryngotracheal autograft is the accurate determination, as far as is feasible, of the extent of the cancer. The endolarynx must be free of disease. No one method of reconstruction is suitable for all cases and the ultimate decision

should be reserved for the time of surgery. Adequate exposure, with visualization, exploration and palpation of the cancer is absolutely essential, with the knowledge that the tumor is still likely to be larger than estimated. Cervical

metastasis is much more apt to be the cause of failure and hence elective neck dissection should be employed. A total thyroidectomy with preservation of at least one parathyroid gland, if possible, is mandatory.

DEPT. OF OTOLARYNGOLOGY, MOUNT SINAI SCHOOL OF MEDICINE, NEW YORK, NEW YORK.

REFERENCES

1. Asherson N: Pharyngectomy for post-cricoid carcinoma. One stage operation with reconstruction of the pharynx using the larynx as an autograft. *J Laryngol Otol* 68:550-559, 1954
2. Wilkins SA, Jr: Immediate reconstruction of the cervical esophagus. A new method. *Cancer* 8:1189-1197, 1955
3. Wookey H: The surgical treatment of carcinoma of the hypopharynx and the esophagus. *Br J Surg* 35:249-266, 1948
4. Bakamjian VY: Total reconstruction of pharynx with medially based deltopectoral skin flap: *NY State J Med* 68:2771-2777, 1968
5. Som ML: Laryngoesophagectomy. Primary closure with laryngotracheal autograft. *Arch Otolaryngol* 63:474-480, 1956
6. Hoeksema PE: Kelly Paterson syndrome and cancer. *ORL* 35:167-170, 1973
7. Simpson JF: A one-stage pharyngoesophagolaryngectomy in which the anterior portions of larynx and trachea were used for reconstruction. *J Laryngol Otol* 74:300-305, 1960
8. Femenic B, Subotic R: Certain problems in the surgical treatment of post-cricoid carcinoma: *Laryngoscope* 72:1346-1350, 1962
9. Denecke HJ: Rekonstruktion des Speisenweges im Bereich des Pharynx und des Halsenesophagus beim Postcricoiden Carcinoma durch Teile des Larynx und der Halstrache. Sonderdruck HNO Wegweiser für die Fadarzflische Parxis II Bandz Heft Feb. 1963, 58-60
10. Ogura J, Biller H: Kopfs und Hals Chirurgia. Chirurgia des Hypopharynx and Oberen Esophagus. Georg. Thieme Verlag Stuttgart. N.H. Hahuman. Vol 1 Hals. 281-335, 1972
11. Som ML: Surgical treatment of carcinoma of postcricoid region. *NY State J Med* 61:2567-2576, 1961
12. Harrison DFN: Pharyngoesophageal replacement in postcricoid and esophageal carcinoma. *Ann Otol Rhinol Laryngol* 73:1026-1041, 1964
13. Olofsson J, van Mostrand AWP: Growth and spread of laryngeal and hypopharyngeal carcinoma with reflections on the effect of pre-operative irradiation. *Acta Otol Laryngologica (Suppl)* 308 Uppsala 1-84, 1973
14. Stuart DW: Cancer of the cervical esophagus. *J Laryngol Otol* 86:317-326, 1972
15. Harrison DFN: Pathology of hypopharyngeal cancer in relation to surgical management. *J Laryngol Otol* 84:349-367, 1970
16. Som ML, Nussbaum M: Surgical therapy of carcinoma of the hypopharynx and cervical esophagus. *Otolaryngol Clin North Am* 631-640, 1969

DISCUSSION OF PRECEDING PAPERS

DOUGLAS P. BRYCE, M.D. (Toronto, Canada): Thank you for asking and giving me the opportunity of discussing these three really remarkable papers. I also want to thank the speakers for giving me their manuscripts well in advance.

I am pleased to see this type of paper being presented at the Laryngological. I think this is the appropriate forum for the discussion of such surgical procedures in the treatment of carcinoma.

With regard to Dr. deFries' paper, I think that perhaps many of us have been reluctant to do total glossectomies on patients with disease so extensive that such a procedure is essential.

I am sure this has been because of two factors; one, the matter of rehabilitation of the patient, and second, the recurrence of tumor after such operative procedures is usually very common and occurs quickly.

Therefore, I think he has made a considerable contribution in vindicating that it is possible to rehabilitate such patients provided that we have sufficient time and the patient survives that period of reconstruction.

I did not notice in the paper whether this good-looking colonel is still alive or not, and perhaps we might hear that this is so.

Now, in the matter of hypopharyngeal cancer, we are dealing with a very lethal disease and I think procedures to treat this disease

should not limit us in the various methods we have in attempting cure.

It has been our feeling and the result of our recent surveys, that preoperative radiotherapy for hypopharyngeal cancer is a desirable procedure and, therefore, I think if you were to list the requirements for any operative procedure for this disease, they might include these three points.

First that the procedure should not limit the ability of the surgeon to completely excise the disease; secondly, that it should be possible following radiotherapy; and, thirdly, that it should be possible for a one-stage procedure because the criticism of surgical procedures in this area in the past has been that patients often develop recurrences before they are out of hospital.

Now, Dr. Lore's procedure is an excellent one in that I believe it can fulfill all criteria, except perhaps the matter of excision. He states that he has excised lesions up to eight centimeters. I think that may be one limitation of this procedure as he has stated because it is not too often that you find a lesion of that relatively small size in that area.

Dr. Som's paper is a classic and there is very little one can say about Max's work in this field, except to point out how good it is and what a master he is in this area.

We have used the autograft — I have not personally, but Dr. Maloney in Toronto has — and have been very happy with the results. Dr. Som mentions that this may not be carried out after therapy and yet this has not been our experience in the few that we have done. Dr. Maloney has successfully used this after a full course of radiotherapy.

The only limitation, of course, as Dr. Som has pointed out very carefully and very thoroughly is the difficulty in assessing the extent of the primary lesion. These have been very interesting and significant papers.

HUGH O. DEFRIES, M.D. (Author's response): In response to Dr. Bryce's question, one of the patients who was fitted with a tongue prosthesis died of cardiovascular disease two years after the initial insertion of the prosthesis, but the second patient is alive with a recurrence at the margin of the gingiva and also with either metastatic disease of the lung or perhaps a second primary.

There is no question about the fact that patients with extensive disease in this area should be afforded the additional insurance perhaps of preoperative or possibly postoperative radiotherapy. And there is no doubt that the use of such treatment, particularly preoperatively, would perhaps preclude or complicate reconstruction, although if properly staged and timed, such reconstructions would not be impossible in the preoperatively irradiated patients.

There is evidence from certain centers, that perhaps in extensive lesions, wherever they may occur in the head and neck, postoperative irradiation is of equal benefit to preoperative irradiation. Therefore, if this does in the long run prove to be true, perhaps reconstruction of such patients should precede radiotherapy which could then be carried out at the completion of all surgery.

JOHN M. LORE, JR., M.D. (Author's response): Just a word to agree with a very important concept that Dr. Bryce mentioned which I believe has an extremely pertinent relationship to any one of these procedures. It is the concept that the ablative surgery should never be modified to accommodate the reconstructive procedure. This is most important.

Sometimes one gets carried away with the reconstructive operation to such an extent that it might modify the ablative surgery. I cannot emphasize that too much.

The other point that also interests me very much is the concept of the mediastinal node dissection in certain situations, as Dr. Som mentioned. I heartily support this concept, as well as the concept of planned postoperative radiotherapy outlined by Dr. deFries.

There are not many radiotherapists in this country who I believe would go along with this idea, but as you know at the M.D. Anderson Hospital, they seem to show that postoperative radiotherapy, planned postoperative radiotherapy, is just as efficacious as preoperative radiotherapy. In these patients with hypopharyngeal and esophageal carcinoma, if the lowest cervical nodes are positive and a mediastinal dissection has not been done, planned postoperative therapy commenced about three to four weeks postoperatively should include the mediastinum in the x-ray port.

ADENOCARCINOMA OF THE LARYNX

JAMES H. WHICKER, M.D.

H. BRYAN NEEL III, M.D.

LOUIS H. WEILAND, M.D.

KENNETH D. DEVINE, M.D.

ROCHESTER, MINNESOTA

SUMMARY—From 1949 to 1974, 27 patients with adenocarcinoma of the larynx were treated at the Mayo Clinic. Histologically, the cancers were classified as indeterminate adenocarcinoma (12 tumors), cylindroma (9 tumors), and mucoepidermoid carcinoma (6 tumors). Patients with cylindromas tended to differ from patients with other adenocarcinomas in respect to sex, symptoms, origin of the cancer, and length of survival. The prognosis of patients with any form of adenocarcinoma of the larynx is very poor.

At the Mayo Clinic in 1948, McDonald and Havens¹ reviewed the records of 339 patients who had adenocarcinoma of the nose, mouth, and throat (9 of whom had adenocarcinoma of the larynx). Since 1948, approximately 3,100 patients with cancer of the larynx have been examined. Of these 3,100 patients, 27 had adenocarcinoma of the larynx. These figures suggest that less than 1% of laryngeal cancers are adenocarcinomas. Because of the rarity of this tumor in the larynx, no series has been large enough to permit statistical evaluation of treatment. However, enough cases have been reported to allow certain generalizations about the natural course of the disease and its alteration by treatment modalities.²⁻⁷ After reviewing the clinical course of our 27 patients, we confirmed the currently held ideas about the relentless course of the disease despite seemingly adequate therapeutic measures.

RESULTS

Of the 27 patients in our series, 23 were men and 4 were women. The average age was 57.5 years (Table I).

The presenting symptoms could be divided into four groups: pain (9 patients), airway encroachment (14 pa-

TABLE I
AGE DISTRIBUTION OF 27 PATIENTS
WITH ADENOCARCINOMA
OF THE LARYNX

<i>Age, yr</i>	<i>No. of patients</i>
30-39	3
40-49	4
50-59	3
60-69	14
70-79	2
80-89	1
Total	27

tients), dysphagia (3 patients), and abnormal cervical nodes (1 patient). The average duration of these symptoms was 17 months.

Histologically, nine of the tumors were cylindromas and six were mucoepidermoid lesions. The other 12 tumors were adenocarcinomas that could not be further subclassified.

The primary site was subglottic in ten patients, in the pyriform sinus in six, supraglottic in five, glottic in two, and hypopharyngeal in one. Thirteen patients had clinically positive cervical metastases at the initial examination, whereas five other patients developed delayed cervical metastases. Thus, 18 of the 27 patients had cervical metas-

From the Mayo Clinic and Mayo Foundation, Rochester, Minn.

TABLE II
CLINICAL COMPARISONS IN 27 CASES OF CYLINDROMA
AND OTHER ADENOCARCINOMAS

	<i>Cylindroma</i> (9 lesions)	<i>Other adeno- carcinomas</i> (18 lesions)
Age	47 yr	61 yr
Males	6 (67%)	16 (88%)
Duration of symptoms	29 mo	15 mo
Subglottic origin	8 (90%)	2 (10%)
Initial enlarged cervical nodes	1 (10%)	6 (66%)
Average survival	103 mo	52 mo

tases during the course of the disease.

As their initial treatment, 13 patients had wide-field laryngectomy, three had supraglottic laryngectomy, one had laryngofissure with excision of a vocal cord cancer, and one had cautery excision of an epiglottic cancer at suspension laryngoscopy. Nine patients had biopsy only, after which they received irradiation. At surgery for the primary lesion, the patients with neck disease had either a partial or a radical neck dissection.

Of the 27 patients, 18 died from uncontrolled disease, and two are alive with disease. Four patients were alive without disease at follow-ups of 4, 7 $\frac{3}{4}$, 21, and 22 years. Three other patients who were free of disease died of unrelated causes; however, all three died within one year of surgery and were not at risk long enough to be included in survival calculations. If these three are excluded from the survival data, then 20 of 24 patients undergoing definitive treatment were not cured of their cancers.

The data become more meaningful if the patients are grouped according to the histologic type of the tumor. Of the 12 patients with indeterminate adenocarcinoma, four had tumors that resembled intestinal adenocarcinomas histologically, and two had tumors that were salivary-like. The average age of the patients with indeterminate adenocarcinoma was 61 years. Of the 12 patients, 11 were men. The average dura-

tion of symptoms for this group was 15 months. Only one patient had a tumor arise from the subglottic area, whereas 11 had tumor origin from the supraglottic or pyriform sinus areas. Seven of the patients had enlarged cervical nodes at the initial examination.

Patients with cylindroma had an average age of 47 years and six of the nine were men. The average duration of symptoms was 29 months. Eight patients had subglottic tumor, and one had a pyriform sinus tumor. Only one had cervical metastasis at initial examination.

All six of the patients with mucoepidermoid tumors were men; the ages averaged 69 years. One patient had a subglottic tumor, whereas five patients had supraglottic, pyriform sinus, or postcricoid tumors. Five of the six patients had cervical metastases at initial examination.

Clinically, patients with adenocarcinoma could be classified into two groups, according to the histology of the tumor: patients with cylindromas and patients with other adenocarcinomas (Table II). The patients with cylindromas were younger. Their pain as a presenting symptom was more intense and was often accompanied by airway obstruction secondary to an intraluminal mass or bilateral vocal cord paralysis. The cylindromas were almost always subglottic and were present for

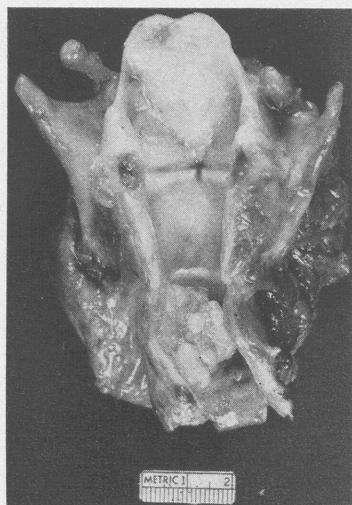


Fig. 1. Subglottic cylindroma.

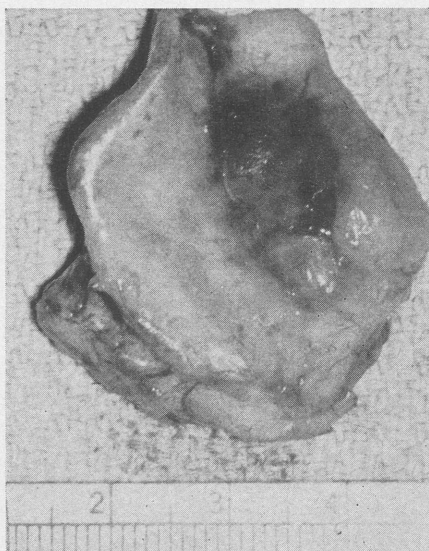


Fig. 2. Adenocarcinoma (indeterminate) of epiglottis.

a long time before diagnosis (Fig. 1). The patients usually presented without cervical metastasis but developed cervical and distant metastases during the course of the disease. Local recurrence was frequent, and death from the disease was usually inevitable despite the extent of primary surgical or radiation treatment. The tumor recurred as long as 15 or 20 years after initial treatment. The average survival of patients who

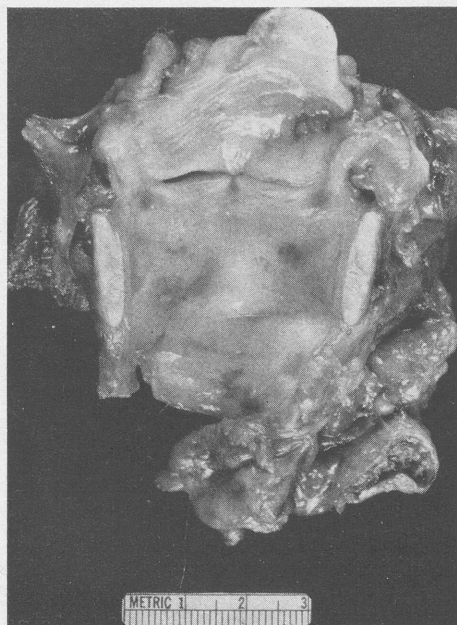


Fig. 3. Adenocarcinoma (indeterminate) of arytenoepiglottic fold.

died with cylindroma was $8\frac{1}{2}$ years.

The patients with other adenocarcinomas were usually older and experienced more rapid growth of their tumors. Airway encroachment was the most common symptom. The tumor was usually located in the supraglottic larynx or in the pyriform sinus (Figs. 1, 2 and 3). The patients often presented with cervical metastases and were likely to develop local and distant recurrences. The average survival of patients who died with disease was $4\frac{1}{3}$ years.

DISCUSSION

Carcinoma of the larynx comprises about 2% of all reported cancers. Of the laryngeal cancers, all but 1 to 2% are squamous cell epitheliomas.

Several excellent reviews have pointed out the histologic characteristics of adenocarcinoma of the larynx.^{8,9} In decreasing order of frequency, most adenocarcinomas are of three histologic types: adenocarcinoma (indeterminate type), cylindroma, and mucoepidermoid.

Although not confirmed, the site of origin of adenocarcinomas probably is the minor salivary or mucous glands. This may explain why so few adenocarcinomas arise from the true vocal cords.

Comparison of the results of treatment for squamous cell epitheliomas of the larynx with those for adenocarcinoma of the larynx reveals a much poorer prognosis for patients with adenocarcinoma of the larynx. Several factors may account for this. An inordinate lapse of time occurs between the onset of symptoms and the final diagnosis of adenocarcinoma. The high incidence of local recurrence and cervical involvement suggests that adenocarcinoma spreads in a more insidious fashion than does squamous cell carcinoma. There is a greater tendency for noncontiguous spread of adenocarcinoma so that block excisions with histologically clear margins may not be adequate in the treatment of this disease. Cylindroma tends to spread from the field of resection along the nerve sheaths as well as hematogenously, and this pattern of spread may be the reason for the nearly impossible task of

obtaining a long-term cure. Also, recent studies have suggested that patients who die from widespread metastases are immunologically incompetent. Future immunologic studies may suggest that host defenses are more inadequate in coping with adenocarcinoma of the larynx than with squamous cell carcinoma.

Our experience suggests that conservation surgery should seldom (if ever) be considered for patients with cylindroma of the larynx. Conversely, the indeterminate adenocarcinomas and mucoepidermoid cancers, because of their predilection for the supraglottic larynx, occasionally will present in a stage suitable for conservation surgery. Neck dissection should be included in most procedures. Radiation therapy has not been used in a planned way either before or after operation. Patients with unplanned preoperative or postoperative radiation have not had favorable results. In patients with cylindromas of the larynx who have not previously undergone irradiation, we reserve irradiation for treatment of local or cervical recurrence. Generally, wide surgical resection offers the best hope of cure.

MAYO CLINIC AND MAYO FOUNDATION, ROCHESTER, MINN.

Request for reprints should be sent to J. H. Whicker, M.D., c/o Section of Publications, Mayo Clinic, 200 First St. SW, Rochester, Minn. 55901.

REFERENCES

1. McDonald JR, Havens FZ: A study of malignant tumors of glandular nature found in the nose, throat and mouth. *Surg Clin North Am* 28:1087-1106, 1948
2. Dogra TS: Adenocarcinoma of the larynx. *J Laryngol Otol* 87:685-689, 1973
3. Cady B, Rippey JH, Frazell EL: Non-epidermoid cancer of the larynx. *Ann Surg* 167:116-120, 1968
4. New GB, Erich JB: Adenocarcinoma of the larynx. *Ann Otol Rhinol Laryngol* 50:706-714, 1941
5. Leroux-Robert J, Courtial C: Tumeurs mixtes et cylindromes du larynx. *Ann Otolaryngol Chir Cervicofac* (Paris) 82:1-14, 1965
6. Havens FZ, Parkhill EM: Tumors of the larynx other than squamous cell epithelioma. *Arch Otolaryngol* 34:1113-1122, 1941
7. MacKenty JE: Malignant disease of the larynx: rare types, premalignant conditions and conditions simulating malignancy. *Arch Otolaryngol* 20:297-328, 1934
8. Soboroff BJ: Cylindromas of the upper digestive and respiratory passages — a correlative study of their histologic patterns, clinical findings and modes of therapy. *Laryngoscope* 69:1381-1410, 1959
9. Toomey JM: Adenocarcinoma of the larynx. *Laryngoscope* 77:931-961, 1967

RESECTION AND ANASTOMOSIS OF CERVICAL TRACHEA

PAUL H. WARD, M.D.

MUHAMMED SAFFOURIE, M.D.

(MOVIE)

DISCUSSION OF MOVIE

DOUGLAS P. BRYCE, M.D. (Toronto, Canada): I assume it is appropriate to make some suggestions that might differ from those of an honored guest, so I will confine my remarks to Dr. Ward. He is the author and is able to withstand criticism. My comments are not all criticism because it is an excellent movie.

There are one or two points, however, that should be emphasized. One is that we have found difficulty in determining the length of the stenosis prior to the surgery and I think this movie perhaps suggests that the same problem was encountered here. It is best to make an incision into the area of stenosis which is apparent and then work proximally and distally to that, so that the total extent of the stenosis can be accurately determined.

I wondered also why, when you developed or found this subglottic stenosis, you used this particular method of management rather than excising the subglottic stenosis, and doing a direct suture which I think is perhaps more effective.

I also wonder about the use of this particular stent with finger cots, the sponge rubber and the skin graft. All of these things are areas in which I have to take exception, or indicate a difference of opinion.

That particular stent we have used before and it gets very foul so that we have given up its use.

I also do not like the skin graft, which in my experience becomes most unwieldy and often has to be trimmed and in this case I noticed there were subglottic granulations.

Now, having said all this, the result of this procedure is excellent so you cannot really complain if you get a good result. The methods I object to, but the result is excellent, so I suppose that criticism is not valid.

MAX L. SOM, M.D.: I enjoyed the presentation immensely. It is an excellent result. I would just like to address my remarks to one cause of tracheal stenosis which we find more and more is becoming a causative factor and that is balloon stenosis following prolonged intubation, especially in the ICU unit.

We have reported some 26 cases recently

of balloon stenosis and we have found that in half of these patients the posterior wall of the trachea, or common party wall which is flexible and extensible, has been preserved. The need for a complete transection of the trachea including the party wall has been limited to only 50% of our cases.

In the rest of them we have been able to preserve the common party wall by virtue of the fact that as the balloon extends, the vessels are compromised by the balloon against the rigid trachea wall in the anterior two-thirds whereas posteriorly with the common party wall, being distensible, the vessels are not compromised and this mucosa in the posterior tracheal wall can often be preserved. This makes a primary anastomosis with preservation of the posterior tracheal wall feasible and makes the procedure less, shall I say, horrendous and it can be performed in 50% of the cases of stenosis associated with balloon and protracted intratracheal anesthesia.

WILLIAM W. MONTGOMERY, M.D.: Yesterday the presiding member of this scientific session advised against stenting following repair of subglottic stenosis. This statement was based on successful laboratory experiments and two clinical cases of subglottic stenosis which, to date, have not been decannulated.

Speaking from a decade of experience with more than 100 cases of subglottic and upper tracheal stenosis, I humbly advocate stenting in all cases, using the solid laryngeal silicone stent for high subglottic stenosis and the silicone tracheal T-tube stent for low subglottic and tracheal stenosis.

Proper internal stenting is not injurious to the mucosal lining of the larynx and trachea providing it is of the proper density and conforms to the normal anatomical contour of the airway. The causes of laryngeal and tracheal stenosis include internal and external trauma, increased intraluminal pressure, friction resulting from assisted respiration and improper internal stenting.

I would thus urge that you stent all cases of laryngeal and tracheal stenosis repair for the following reasons: 1) there is added support to the suture line; 2) there is less chance for granulation tissue formation; 3) there is

definitely less scar tissue formation with resultant contraction; 4) there is a significantly reduced incidence of recurrent stenosis; 5) a more adequate airway can be anticipated; and 6) the mortality is nil.

JOHN M. LORE, JR., M.D.: I too wish to compliment the authors on an excellent movie. In this presentation two pathologic situations are depicted.

A subglottic stenosis of the larynx and a tracheal stenosis are present and I believe this has to be differentiated from a purely laryngeal problem and a purely tracheal problem.

The only point with which I would differ is regarding the split thickness graft. I would agree with Dr. Montgomery since I much prefer the buccal mucosa or septal mucosa for a laryngeal or tracheal lining.

And then, the question of tracheostomy comes up. I believe there was no doubt in this patient presented that a tracheostomy was necessary because of subglottic and laryngeal problems.

On the other hand, I would just like to emphasize that when the trachea alone is involved and especially lower in the neck, a tracheostomy is usually not the procedure of choice. A simple end-to-end anastomosis with an indwelling endotracheal tube can be utilized for a short period of time thereafter with the head flexed forward. It is almost impossible to resect the low portion of cervical trachea and still maintain a tracheostomy.

I would just like to raise one other point. Dr. Montgomery mentioned the use of a stent and I would certainly agree with him as far as the larynx is concerned. But the use of a stent in pure tracheal stenosis may well be utilizing the very modality which caused the stenosis in the first place and that is pressure, particularly on the anterior wall of the trachea.

PAUL H. WARD, M.D. (Author's response): I am always delighted to present anything that brings up a controversy because I think we learn by these experiences. I do not claim to have the experience of many of the people that have discussed the paper — not the experience of any of them — but I think the fact that many of you discussed different techniques means there is no single solution to this problem that is a uniform winner. Otherwise, we would all be using the same one. We are all seeking success.

I adapted this technique following its use in acute trauma (after Dr. Harris's work) and I do not know who preceded him in using it for the acute problem of trauma of the trachea and larynx. It consists of putting in the soft foam rubber stent with a skin graft when there were lacerations and we found it just amazingly successful.

I then adapted it to the chronically stenosed trachea and used it in this particular case, which is unusual and represented an extension of the stenosis into the larynx. It has worked approximately a half to three-fourths of the time for me and I think that is as good as any statistics in the literature on the care of chronic stenosis of the trachea. I have used this technique in 15 or more cases.

The skin grafts have worked very well. It does not always work; as they sometimes restenose again.

I make a point also of this being a soft spongy rubber and not a hard tube and I agree completely with Dr. Lore that putting hard firm tubes into the larynx and trachea for long periods of time is violating the exact principle that we talk about in intubation.

A soft foam rubber stent that does not move but has enough spring against the wall and is taken out at two weeks I do not think is as traumatic certainly as a hard, more firm tube. Applying this same principle, indeed it may be that we do not need stents in some cases. The recent paper, I believe by Pearson, advocating not stenting and not doing tracheotomies, may have merit. He had 38 cases and had remarkable success, only five required revision but he had two deaths. I think two deaths is too many for this type of procedure. I would sacrifice the voice and the airway rather than have death.

Certainly we would have liked to have had a nice clean resection and put end-to-end. The reason for the graft in this particular situation was that there was an involved area at the larynx after resection and to resect the subglottic stenosis would have meant taking the entire cricoid and anterior portion of the cricoid ring, which we preferred not to do. We therefore cored it out, and put in the graft.

I am pleased to have Dr. Saffourie come back from Kuwait to present this movie. I am very pleased to have all of you respond in this way. There is always room to do things differently, when we seek improvement.

Executive Sessions

FIRST EXECUTIVE SESSION

FRIDAY, APRIL 26, 1974

The first Executive Session of the Ninety-fifth Annual Meeting was convened at 8:05 A.M. in the Venetian Room of The Breakers, Palm Beach, Florida by President G. Slaughter Fitz-Hugh, M.D.

The following candidates were unanimously elected:

For Active Fellowship:

Bobby R. Alford, M.D., Houston, Texas
William R. Hudson, M.D., Durham, N.C.
Frank N. Ritter, M.D., Ann Arbor, Michigan
James B. Snow, Jr., M.D., Philadelphia, Pa.
Paul H. Ward, M.D., Los Angeles, Cal.

For Emeritus Fellowship:

Lawrence C. McHenry, M.D., Oklahoma City, Okla.

Following their election the new Fellows were presented to the assembled Fellowship by their respective sponsors and welcomed into the Association by President Fitz-Hugh.

Election of the Nominating Committee, with Francis W. Davison, M.D. as Chairman, completed the agenda for the first session.

SECOND EXECUTIVE SESSION

SATURDAY, APRIL 27, 1974

The second Executive Session was opened by President Fitz-Hugh at 8:05 A.M. in the Venetian Room of The Breakers. Annual reports of the Officers of the Association and reports of Committee Chairmen were then presented and accepted.

REPORT OF THE SECRETARY

The membership as of the date of the Ninety-fifth Annual Meeting, April 26-27, 1974, is as follows:

Active	92
Emeritus	33
Honorary	10
Corresponding	15
<hr/>	
Total	150

The Annual Meeting of the Council was held in Philadelphia, January 13, 1974. Its second meeting was held at The Breakers, Palm Beach, Florida, April 25, 1974, immediately preceding the Annual Meeting. Two subjects were discussed at some length at both meetings: 1) The Association's role in supporting research and 2) the Hundredth Anniversary celebration in 1978.

Dr. David DeWeese, Chairman of the Research Committee, has made a thorough analysis of the Research Fund in the context of current funding of research and has submitted a report which is part of today's agenda.

Dr. Alden Miller, Chairman of the Hundredth Anniversary Committee, will give his report.

A review of the membership status indicates that a larger number of candidates may be proposed in the Active category without exceeding the constitutional limit of 100.

The locations of the Annual Meetings in the coming years are as follows:

1975	Regency Hyatt House, Atlanta, Ga.	April 13-14
1976	The Breakers, Palm Beach, Fla.	April 25-26
1977	Sheraton-Boston, Boston, Mass.	May 8-9
1978	One Hundredth Anniversary — Site to be selected	
1979	San Diego, Calif.	

I would like to comment on the current procedure for electing Fellows. Proposals of candidates are received in the Secretary's office until September first of each year. The Secretary prepares the applications and curricula vitae and distributes them to the Membership Committee. This Committee is made up of the four Councilors who are the four recent Past Presidents. The Committee reviews the applications and recommends whether or not their names be entered on the ballot. If there is doubt about a candidate being successful on the balloting, the Committee recommends that the application be held for the Annual Meeting of the Council in January. In this way, the full Council makes the decision about a doubtful candidate.

The purpose of the Membership Committee is to make reasonably sure that the individuals proposed have a good chance of being successful on the ballot. It is embarrassing to the candidate and to the proposers when the candidate fails to receive the required votes for acceptance. It is our hope that all candidates proposed will be successful in the balloting. Each candidate should be judged on his own merits. We do ask you to rate the candidates, but my plea is not to let the rating influence your judgment regarding the candidate's worthiness to become a Fellow. When a "no" vote is given, the reason for it should be stated. Five "no" votes eliminate the candidate from being nominated for that year.

He may be proposed again after a lapse of three years. The vote of the membership indicates to the Council that the candidate is acceptable. At their Annual Meeting in January, the Council makes the final decision to nominate those candidates who have been successful in the balloting.

In the past, members have raised the question about whether the candidate is a laryngologist, if he has not published on laryngological subjects. According to the By Laws, the purpose and scope of the Association is to advance the art and science of Rhinology and Laryngology. This is a broad umbrella covering most of our field, with the exception of Otology.

An analysis of our membership and its projection for the next few years indicates that the Association will be able to accept a larger number of proposals for membership without exceeding the limit of 100 active members. So, again, I would urge you to propose candidates early and if you do not intend to propose a candidate yourself, but would like to suggest the names of likely candidates, the Secretary will be very happy to receive your suggestions.

Respectfully submitted,
John F. Daly, M.D.
Secretary

(This report was duly accepted by the Fellows.)

REPORT OF THE TREASURER

Exhibit A

AMERICAN LARYNGOLOGICAL ASSOCIATION
GENERAL FUND
OPERATING STATEMENT AND FUND BALANCE
FISCAL YEAR ENDING MARCH 31, 1974

Income

Dues (91 @ \$100; 5 new members @ \$150)	\$9,850.00	
Sale of Transactions	1,266.00	
Sale of Banquet Tickets	2,276.00	
Interest (Savings Acct. 550.53; S & L 781.18)	<u>1,331.71</u>	\$14,723.71

Expenses

Annual Meeting 1973 (St. Louis)		
Reception and Banquet	\$2,965.39	
Reporting	664.03	
Projection	202.00	
Programs and Memb. Certs.	554.75	
Guest of Honor (Dr. Hoover)	473.09	
Publicity (Beaumont-Heller)	100.00	
Miscellaneous	<u>244.78</u>	
Total Annual Meeting Expense		5,204.04
Council Meeting Expense		1,800.73
Transactions and Editorial Expense		2,832.80
General Expense		
Stationery, printing, postage	2,074.81	
Clerical Hire	450.00	
Auditing	175.00	
Treasurer's Bond	55.00	
Dues-Int. Fed. Otolaryng. Socs.	100.00	
Nat. Soc. Med. Research	100.00	
Amer. Council (100 for '73; 150 '74)	250.00	
1/3 Delegate Am. Bd. Med. Specs	<u>74.75</u>	
Total General Expense		<u>3,279.36</u>
Total Expenses		<u>13,116.93</u>
Net Income for Year		1,606.78
Fund Balance March 31, 1973		<u>7,633.35</u>
Fund Balance March 31, 1974		9,240.13

Exhibit B

AMERICAN LARYNGOLOGICAL ASSOCIATION
TRUST FUND
OPERATING STATEMENT AND FUND BALANCE
FISCAL YEAR ENDED MARCH 31, 1974

Income

Interest on U. S. Series H Bonds	\$ 377.32	
Dividends Common Stocks and Mutual Fund	<u>1,808.54</u>	\$ 2,185.86

Expense

		<u>0.00</u>
Net Income for Fiscal Year		2,185.86
Fund Balance March 31, 1973		<u>79,224.36</u>
Fund Balance March 31, 1974		81,410.22

TRUST FUND ASSETS

Cash		\$ 3,905.97
Savings Certificates (First Federal Savings and Loan Assn. of Philadelphia)		20,000.00
Investments (Exhibit D)		
U. S. Bonds Series H at cost, par and maturity	\$ 6,500.00	
Common Stocks		
Purchased (at cost)	\$11,617.52	
Donated (market value at donation)	<u>2,362.00</u>	13,979.52
Mutual Fund (Mass. Inv. Trust) at cost		<u>37,024.73</u>
		<u>57,504.25</u>
Total Trust Fund Assets		81,410.22

CASH SUMMARY

Cash in Commercial Account (Girard Bank—Philadelphia)	2,331.75
Cash in Savings Account (Girard Bank—Philadelphia)	<u>10,814.35</u>
	13,146.10
Allocation:	
General Fund (Exhibit A)	\$ 9,240.13
Trust Fund (above)	<u>3,905.97</u>
	13,146.10

Exhibit C

AMERICAN LARYNGOLOGICAL ASSOCIATION
INDIVIDUAL TRUST FUNDS
MARCH 31, 1974

	<i>Principal and Retained Earnings 3/31/73</i>	<i>Earnings*</i>	<i>Donations</i>	<i>Awards</i>	<i>Principal and Retained Earnings 3/31/74</i>
Casselberry	\$10,726.91	\$ 295.96			\$11,022.87
Johnston	10,156.39	280.22			10,436.61
DeRoaldes	6,763.40	186.61			6,950.01
Newcomb Trust	3,987.33	110.01			4,097.34
Newcomb Prize	930.64	25.68			956.32
Research	29,986.14	1,287.38			31,273.52
Memorial	<u>16,673.55</u>	<u>0.00</u>			<u>16,673.55</u>
	79,224.36	2,185.86	0.00	0.00	\$81,410.22

* Net income for the year is allocated to each fund in the ratio it bears to the total value of the trust funds at the beginning of the year, except that by action of the Council January 13, 1974, current income from the Memorial Fund is added to the Principal and Retained Earnings of the Research Fund.

Exhibit D

AMERICAN LARYNGOLOGICAL ASSOCIATION
TRUST FUND INVESTMENTS
MARCH 31, 1974

Savings Certificates (First Federal Savings and Loan of Philadelphia)			\$20,000.00	\$20,000.00
U. S. Government Bonds				
Six \$1,000.00 Series H Bonds (at cost)			6,000.00	
One \$500.00 Series H Bond (at cost)			<u>500.00</u>	
Total U. S. Government Bonds			6,500.00	\$ 6,500.00
Common Stocks:	<i>Number of Shares</i>	<i>Cost</i>	<i>Market Value at Donation</i>	
American Telephone and Telegraph Co.	200	\$10,790.16		
International Business Machines Corp.	1		517.00	
International Business Machines Corp. (1)	9	803.98		
McDonnell Douglas Corp. (2)	112		1,170.00	
McDonnell Douglas Corp. (3)	14	23.38		
McDonnell Douglas Corp. (4)	3			
McDonnell Douglas Corp. (5)	3			
McDonnell Douglas Corp. (6)	33			
McIntire-Porcupine Mines, Ltd.	15		<u>675.00</u>	
		\$11,617.52	\$ 2,362.00	13,979.52
Mutual Fund (Massachusetts Investors Trust (at cost)				<u>37,024.73</u>
Total Trust Fund Investments				\$77,504.25

- Notes: (1) Includes 7½ shares received in stock splits 1965, 1966, 1968, 1973.
 (2) Includes 86 shares received in stock dividends and splits 1964, 1965, 1966.
 (3) Includes 13.44 shares received in stock split 1967; rights exercised to purchase 0.56 share.
 (4) Shares received as stock dividend (3%) in 1972; fractional share sold.
 (5) Shares received as stock dividend (3%) in 1973; fractional share sold.
 (6) Shares received as 5 for 4 stock split 4/30/73.

Respectfully submitted,
Charles M. Norris, M.D., Treasurer

(This report was duly accepted by the Fellows.)

REPORT OF THE ACCOUNTANT

To the members of the American Laryngological Association
Gentlemen:

We have examined the statements of cash receipts and disbursements of the AMERICAN LARYNGOLOGICAL ASSOCIATION, including Trust Funds, for the fiscal year ended March 31, 1974. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

Cash receipts and disbursements were verified as recorded to date, and all securities were examined or accounted for as of this date.

In our opinion, the accompanying statements of cash receipts and disbursements present fairly the financial position of the American Laryngological Association and its Trust Funds at March 31, 1974, on a cash basis, and the results of its operations for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

Respectfully submitted,

NEMORE, GRAHAM & COMPANY
Certified Public Accountants

April 15, 1974

(This report was duly accepted by the Fellows.)

REPORT OF THE LIBRARIAN, HISTORIAN AND EDITOR

The Ninety-fourth Annual Meeting of the American Laryngological Association was held on April 1 and 2, 1973 at the Chase-Park Plaza Hotel, St. Louis, Missouri. Seventy-nine Fellows (including 65 Active, 1 Honorary, 2 Corresponding, and 11 Emeritus) and 230 guests were officially registered.

With the excellent cooperation of all but one of the essayists, the completed papers were in the hands of the ANNALS Publishing Company in St. Louis within ten days following the meeting. One paper, unfortunately, was never received in spite of numerous and fruitless letters and phone calls requesting it for publication. The completed transcript of the proceedings was received from our efficient reporter, Mrs. Edna Pollack, of the Martin Johnson Agency, on April 24, only three weeks following the meeting. Most of the corrected discussions this year were promptly returned to the Editor, so that the completed final manuscript was in the hands of the publishers by May 16th. With the excellent assistance of the ANNALS staff, galley proof was received on July 3 and returned corrected on July 6.

Although this year, according to the rotation policy of the ANNALS Board, the papers were not published until the September-October issue, the binding of the TRANSACTIONS could be completed beforehand. It was possible, therefore, to get them in the mail on an extremely early date (September 17th). One-hundred-five copies were sent to the 95 Active and the 10 Honorary members, along with one copy each to the Library of Congress and the National Library of Medicine. There were 42 standing orders and 8 single orders, but since publication we have had an additional 25 orders, making a total of 182 volumes now distributed.

Two hundred twenty volumes were ordered. Because this year we had only 160 pages (as opposed to 230 pages last year) the cost was only \$2,742.35 plus editor's expenses, or \$2,833.00. As a result of the price increase to \$15 by vote of Council (I might add without a single complaint), we have so far been able to collect a total of \$1,266.00 for this ninety-fourth volume.

The scientific meeting was recorded again this year by the Audio-Digest Foundation of Los Angeles. A complete tape of the presented papers was sent to the Editor. Mr. Al Walters of the Beaumont, Heller and Sperling Company, who took care of publicity, was unusually helpful this year and gave us much greater coverage in the lay press as well as the various medical journals. Several of the essayists were interviewed personally by the press with photographs appearing in the papers, and even your Editor was given a place on a television talk show!!

For the past several weeks the Editor has been working on the 10-year index, which will be published in the 1974 volume. This should be of great assistance when trying to locate papers presented at the Annual Meetings during the past decade.

It is now the sad duty of the Historian to record officially the deaths of six loyal Fellows during the past year:

EMERITUS

Gordon Douglas Hoople, Elected 1944

Percy Egerton Ireland, Elected 1952

ACTIVE

Victor Ricardo Alfaro, Elected 1958

Joseph Pitman Atkins, Elected 1958

John Swann Knight, Elected 1965

Francis Loeffler Lederer, Elected 1953

Their names will always remain fondly in our memory.

Respectfully submitted,

Charles F. Ferguson, M.D.

Librarian, Historian and Editor

(This report was duly accepted by the Fellows.)

REPORT OF RESEARCH FUND COMMITTEE

(Please accept my apologies for not presenting this report in person. It is necessary for me to leave this meeting one day prior to your business session.)

The Research Committee has not met at the time this report is written. If necessary, an addendum to this report will be added following our meeting this week.

In December of 1973, an extensive report was sent to the Council of this Association. Although that report reviewed some of the past activities and problems of the Research Fund, its main thrust was a request for the Council to make two decisions. Because of the limited amount of income from the Research Fund, the Council was asked to instruct this Committee whether we should continue to fund small projects for \$1,000 to \$1,500 (total) per year or

whether we should expend all of the funds (approximately \$31,000) on one or two major research efforts and then get out of the business of funding research. The Council's answer was that we should continue to fund research as in the past but that, for the year 1974-75 the income from the Memorial Fund can be added to the income of the Research Fund. This is not a precedent and is legal according to the stated purposes of each fund.

The Committee's second request was that, to be productive, the principal of the fund must be increased. We suggested that an appeal be made to the membership and/or other interested persons or organizations for substantial donations to the Research Fund in order that its income would be realistic in funding research. The Council answered that it would stimulate interest in soliciting gifts to the Research Fund.

I would like, therefore, to request that each of you seriously consider a gift to the Research Fund of this Association — either now or at that time of the year when you consider your personal gifts to scientific and charitable organizations. I further urge you to seek similar funds from your colleagues in medicine, your patients at times, and any other organizations with whom you may have some influence.

At the present time, the Research Committee is considering two projects for funding; one on the pathogenesis of subglottic stenosis and one on possible immunologic causes of laryngeal papillomatosis.

Six other requests for information regarding available funds have been answered recently. None of these have yet submitted a protocol for Committee consideration.

Our next report to the midwinter Council Meeting will certainly have some specific dollar requests for approval of the Council. We have indicated that any protocol to be considered by the Council in January of 1975 must be in the hands of the Chairman of the Committee by August 15th of 1974.

Respectfully submitted,

David D. DeWeese, M.D., Chairman

(This report was duly accepted by the Fellows.)

REPORT OF 100TH ANNIVERSARY COMMITTEE

I do not know if you all know that the term "throatspecialist" and that medical entity it represents actually began in the United States in about the first third of the nineteenth century. Laryngology and laryngoscopy began in 1858 with the introduction of the mirror by Manuel Garcia.

Within one year a Dr. Zermack began using it, and reporting on it. Within another one to two years it reached the United States, thus in 1860 or 1861.

By 1873, there was enough interest in this new field of laryngology and laryngoscopy that the New York Laryngological Society was founded.

Five years later in 1878, the first national Association of Laryngologists — the American Laryngological Association — was founded. So in four years, we hope to celebrate the hundredth anniversary of that founding.

The first annual meeting was held at Delmonico's in New York in the summer of 1879.

Now, your Council thinks that this event is of enough importance, since our Society, with its history and its heritage, is held so high, that the hundredth celebration should really be a good one.

Our preliminary thoughts are that at our annual meeting we hope to have a very interesting history of our Association, and that we will have as interesting a meeting as we can. Hopefully, at the present moment, we are thinking of having it in the same city and possibly the same place as the original meeting.

There will be a very suitable and innovative souvenir that will be worthy of what we are doing and there will probably be some kind of special observance by a person, or by tableau or something, of the event that took place a hundred years before.

I have two points to make. I will make the easy one first; that is easy for all of you.

The committee is open to every one of you who really wants to volunteer to help us. The committee to do the history or that part of it are thinking that we would certainly like to have photographs of the founding fathers and the famous ones that followed them, and that we would like to have photographs of the actual instruments that were first used a hundred years ago.

We want to know how laryngology spread from this beginning into different parts of our country, so I am making the plea that if any of you can supply us with any of these things, do it.

I have already had some wonderful volunteered efforts from Dr. Clerf and Dr. Goodale and Dr. Daly who has done a lot of research previously. The committee however, is open to every one of you. I want to add that Dr. LeJeune has offered to help, so those of you who have already volunteered are going to be reminded by me, but hopefully I am appealing to the rest of you to help us.

Now, my final point, Mr. President, which will be ended with a motion. The Council decided that such a program as we want to put on which is based on what has been done by other societies is going to cost money.

To make it souciant, I am hereby moving that each active member of our Association will be assessed \$25 a year beginning with this year continuing through your bill for 1977 which is \$100, that the emeritus fellows will not be billed but if they plan to attend and participate in this 1978 meeting, that they can either wait until then and pay the \$100 in one sum or they can send it in in the four bits. And, to answer further all questions, our honorary guests will not be charged by us if they are there at the meeting.

I make this motion of the \$25 a year assessment. It is obligatory for all active members, it is elective for emeritus members.

Respectfully submitted,
Alden H. Miller, M.D.

(Motion was passed by Fellows.)

REPORT OF THE AMERICAN BOARD OF OTOLARYNGOLOGY

As representatives of the American Board of Otolaryngology to the American Laryngological Association, Inc., we are pleased to report to you on the activities of the American Board of Otolaryngology.

The officers of the American Board of Otolaryngology are: Dr. David D. DeWeese, President; Dr. George F. Reed, Vice-President; Dr. Walter P. Work, Secretary-Treasurer and Dr. Dean M. Lierle, Emeritus Secretary-Treasurer.

The objectives of the American Board of Otolaryngology are: the establishment of standards of qualifications for otolaryngologists who desire and request Board certification; to determine which candidates fulfill these standards of qualification; to examine such candidates and issue certificates upon satisfactory completion of requirements; and to encourage development and maintenance of the highest standards on the teaching and training of otolaryngologists.

As reported to you last year the format of the examination has been changed. It is now on a computerized basis with professional consultation. In general, this change in format has received the approval of the Directors of the American Board of Otolaryngology although some of the older Directors are inclined to believe that the examination of patients performed by the candidates, which has been deleted from the present examination, permitted better evaluation of the clinical ability of a candidate than do the simulated protocols now utilized.

The examination for 1973 was held in the Palmer House, Chicago, Illinois, from October 26 to November 2, 1973. A total of 374 candidates were examined of which 320 were certified.

Newly elected members of the Board of Directors of the American Board of Otolaryngology are: Dr. Bobby R. Alford, Dr. John T. Dickinson, Dr. Alden H. Miller and Dr. James B. Snow.

The following Directors were promoted to emeritus status as Senior Counselors: Dr. John E. Bordley, Dr. Jerome A. Hilger and Dr. Clair M. Kos.

We believe it should be brought to the attention of the Fellowship of the American Laryngological Association, Inc., that through the influence of the American Board of Medical Specialties, the autonomy of the various Boards is in the process of being lost. There is a concerted effort to streamline the Boards and the suggestion has even been made that all Boards be eliminated and that the only certification issued be by the Liaison Committee on Graduate Education.

Respectfully submitted,

Frank D. Lathrop, M.D.

Paul H. Holinger, M.D.

(This report was duly accepted by the Fellows.)

REPORT ON THE AMERICAN COUNCIL OF OTOLARYNGOLOGY

On April 1, 1974, Harry W. McCurdy, M.D. assumed the Executive Directorship of the American Council of Otolaryngology replacing Dr. Raymond E. Jordan. As Col. McCurdy of Walter Reed Hospital, the new Executive Director has had more than adequate exposure to the Washington scene, and the Council will no doubt benefit greatly from his experience in the governmental arena.

The spring meeting of the Board of Directors was held at The Breakers Hotel on Saturday evening, April 20, 1974. Several constitutional amendments

were adopted, of which the most significant is that the President and Vice-President are to be limited to one year in each office, and that the Vice-President will be designated as Vice-President/President-Elect.

Largely through the efforts of the American Council, the American Board of Allergy and Immunology has been requested to change its name to the Conjoint Board of Medical and Pediatric Allergy and Immunology and this alteration was formally recommended by the AMA House of Delegates at its December, 1973 meeting. If implemented, this should take care of the situation threatening other specialties whose members are active in the field of allergy.

As pointed out by the Future Planning Committee, one recurring problem has to do with delineation of responsibilities and the avoidance of effort-duplication on the part of various groups within the specialty. It should be re-emphasized that the American Council of Otolaryngology's function is to represent otolaryngology in all areas relating to legislation and government health and committee activity in Washington, that the Academy is concerned with continuing education in otolaryngology and that the Society of University Otolaryngologists is involved chiefly in residency training in the specialty. Some conflicts of interest between the Academy and the Council are currently under review.

The Council's Hearing Committee, under the direction of Dr. Mansfield Smith, has prepared a series of guidelines for legislation in the areas of speech pathology and audiology, hearing aid dispensing, and noise induced hearing loss. This material is being distributed to the Council's state chairmen.

There are many additional committees at work including the Manpower Analysis Committee, and the National Relative Value Scale Committee.

Members of the American Laryngological Association are urged to stress the importance of the American Council to their colleagues, house staff and all practicing otolaryngologists.

Respectfully submitted,

Stanton A. Friedberg, M.D.
A.L.A. Representative

(This report was duly accepted by the Fellows.)

REPORT FROM THE BOARD OF GOVERNORS AMERICAN COLLEGE OF SURGEONS

At the morning session Bentley Colcock, Chairman of the Board of Governors, presided as the officers and committees made their reports. The College President, William Longmire, discussed the future of surgery and the College's influence thereon. He reported on special meetings of the College advisory councils aiming to bring the surgical specialties in closer communication with the College. (I personally attended the June 7, 1973 meeting on working effectively and found it fruitful.) Dr. Longmire further reported on the meetings of Young Surgeons of the College most recently held in Chicago in March, 1973, knitting still another large group of surgeons more closely to College activities. He discussed the continuing educational opportunities offered by the College and especially the SESAP program. It was felt more proof of continuing education will be needed as the state laws require this in the future.

Dr. Englebert Dumphy, Chairman of the Board of Regents, discussed relations between the Regents and the Governors and pointed out how crucial the next decade will be for our profession.

Dr. C. Rollins Hanlon, Director of the College, discussed problems arising from the recent shortening of the maximum tenure of Governors from nine to six years. A suggestion was made that an expanded orientation session occur with the spring meeting so that the fledgling governors are not totally lost in their first one or two meetings.

Dr. David Sabiston, Secretary of the Board of Governors, reported there were a total of 189 seats on the Board of which 64 were specialty governors. He mentioned the Executive Committee had approved a new seat for the American Academy of Facial Plastic and Reconstructive Surgery effective in 1974.

The fiscal affairs were reported on by Dr. Morton Orlov. The detailed budget may be seen this year in the July Bulletin of the American College of Surgeons, and a summary of the financial status appeared in the February, 1974, issue of the Bulletin which I will not quote.

The Professional Liability Committee under Dr. Frank Shively reported its ongoing activities, followed by spirited questions and answers.

The entire afternoon program from 1:30 to 4:30 was devoted to PSRO legislation, highlighted by an address by Senator Wallace Bennett of Utah, the author of this legislation. Most of what was said has been reprinted in the Bulletin and many changes have already been made in the effective regulations since October. As you know, the American Medical Association made a partial turn around in its position at Anaheim in December, 1973, and reverberations of this are being felt.

The second session of the Board of Governors met on October 17 in the afternoon. Much of this meeting was open comments from the floor discussing the previous meeting of the Governors, local arrangements in Chicago, etc. At this meeting our fellow member, Dr. Loring Pratt, a Regional Governor from the State of Maine, was elected to the post of Regent, in effect replacing our former President, Paul Holinger, whose nine years in this position had expired.

Certain statistical information is of interest from the meeting of the Advisory Council on Tuesday, October 16. Total number of fellows in the American College of Surgeons is 32,600 of whom 1,427 are active otolaryngologists and 186 list themselves as EENT men. There were 163 otolaryngologic initiates at this meeting which is the highest ever initiated at one session and is exceeded only by urologists. Of these initiates 96.7% are board certified.

On cross checking the active fellows of the American Laryngological against the American College Directory I find that approximately 80% of the active members of the Laryngological are members of the College but in the younger years it is virtually 100%. It is felt we do need closer ties with the College. They should speak more for us. I will be happy to transmit any information I can. The membership in the Advisory Council for Otolaryngology to the American College as of January 1 consists of John T. Dickenson, Alvin Novack, Joseph Ogura, William Saunders, and Harold Tabb, all of whom I am sure are also as anxious as I for more input.

Respectfully submitted

William M. Tribble, M.D., F.A.C.S.
Governor

(This report was duly accepted by the Fellows.)

REPORT ON THE AMERICAN COUNCIL OF OTOLARYNGOLOGY

On the first and second of March in Houston, a meeting was held for two days to discuss the problem of recertification in American medicine.

As some of you may have heard part of this report at other meetings, my comments this morning will be abbreviated and then if you have any questions I will be glad to try and answer them.

The meeting was called under the aegis of the Bureau of Health Resources Development, I believe, from NIH. Dr. Dublin was chairman and the point of contact with the American Board of Medical Specialties whose name you have heard mentioned this morning.

Dr. Holden being the President of the ABMS, called the meeting to order and ran the first third of it.

During that third, we heard Dr. C. B. Chapman, who is the Vice-President of the Commonwealth Fund, give the keynote speech. Dr. Chapman reviewed several points on licensure. He wound up by saying that in his opinion some form of recertification was almost inevitable, and he pointed out that the two major factors responsible for that change would be: 1) Changing concepts of medical liability — the old rule of regional quality care now being replaced by one which says a patient has the right to as good medical care as there is in the land rather than in his region. 2) A strong wave of consumerism which we are now experiencing in this country. So it was his opinion that this was inevitable in some form or another.

Then Dr. Holden called upon members from these boards, and by the way, I might say that the congress was limited to 150 attendees with 22 medical boards represented there: 1) The American Board of Family Practice; 2) the American Board of Internal Medicine; 3) American Board of Pediatrics; and 4) American Board of Surgery. They give reports with varying enthusiasm on their own concepts of how recertification should be done.

Some of them have done a lot of work on this project already. The American Board of Pediatrics has spent a lot of money and a lot of time designing a recertification system. The Board of Family Practice has as well.

The American Board of Surgery has not done anything specific yet except to adopt a resolution which says that by 1985 recertification will be mandatory and at the time they will be issuing ten year self-destructing certificates which will require a practitioner to then take an examination again or no longer have a valid certificate, but they have not really got cracking on the problem yet.

The next third of the meeting was taken up by workshops. There were five of such, I believe. They had to do with techniques by which large numbers of people could be examined. There were examples of the use of the computer, television and actors taking the place of patients, or electronic models taking the place of patients. Another one spent a lot of time talking about the use of auditing medical records as a means of evaluating the quality of a doctor's practice. They were interesting to me, but at the moment seemed cumbersome or expensive and in very much need of considerable refinement before they would be very practical.

Then at the end, the final third of the meeting, we got back together again. This point we adopted ten resolutions which had been made by a committee on recertification of the American Board of Medical Specialties before the meeting started. We discussed these cursorily and without much enthusiasm but then they were approved. I shall leave those resolutions with Dr. Daly, your Secretary, in case anyone would like to read them. I think they should be read.

Now, two final points. My own opinion, if I may just give it to you briefly, is this: this is potentially one of the most disrupting things to hit the practice of medicine in this country for a very long time if it is rushed into and not well thought out.

I have a certain amount of disquiet in my own mind because I did not hear any devil's advocate at this meeting at all. It was taken for granted that this is here and that it would be and so let us get on with it. I would personally like to have heard somebody express whatever the opposing view might be, not that I am opposed to improving the care of patients at all, but just a modifying voice would have been welcome there.

There are two additional boards which made comments. The American Board of Radiology had got into the study of this problem as early as 1968 and they were enthusiastically making plans to test their members until finally somebody suggested that perhaps they should poll the membership to find out how many people were interested in pursuing this plan, and very much to their surprise, 40% of respondents wanted nothing to do with it. So, with that large number being opposed, that Board cooled their ardor for it and they are now dragging their feet a bit wondering what next to do.

The pathologists think they will not have anything to do with testing. They are very much in the business of continuing education and have been for a long time and so they feel that they will continue using that route to ensure medical competence rather than go into the testing business.

We, I believe, in otolaryngology, have a committee which is active on this subject but there has been no publishable plan as yet.

Respectfully submitted,

Col. Harry W. McCurdy, M.D.
Executive Director

(This report was duly accepted by the Fellows.)

REPORT OF THE REVIEW COMMITTEE OF THE AMERICAN COUNCIL OF OTOLARYNGOLOGY'S MANPOWER ANALYSIS COMMITTEE

The review committee met in Washington, D.C. on March 27, 1974. Those attending consisted of members of the Council staff, the Council's Manpower Committee members, otolaryngologists representing the various professional organizations as the American Laryngological Association, the American Otological Society, the Triological Society, the Academy of Ophthalmology and Otolaryngology, the Centurion Club, and others. Also present were otolaryngologists in private practice, otolaryngologists in teaching institutions, individuals in related specialties, representatives from NIH, such as a biostatistician and a consultant system analyst. There were approximately twenty-five individuals present.

The meeting was opened by welcoming remarks from Dr. R. C. Jordan, retiring Executive Director of the Council, who also introduced Dr. Harry McCurdy, who is succeeding him in this office.

Dr. John Bordley outlined the objectives and historical background of the Manpower Analysis project, specifically warning that no definite conclusion should be made from the material presented at this time, as it was incomplete and in some instances not adequately prepared for presentation. The committee

sought critical input into the survey by the specifically invited guests and representatives of the various organizations.

The methodology of the survey was outlined by Mr. Bernard Kroll. Points of discussion were survey design, form design, mailing procedures, follow-up procedures, and data processing, to mention a few.

Special Reports.

A. The Otolaryngologist-in-Training. Leader — Dr. D. Fairbanks

The questionnaire was sent to 106 programs with responses obtained from 769 residents. This was thought to be representative of approximately 81% of the residents in approved training programs. Many interesting questions, such as geographic distribution, source of funding, age, marital status, postresident training being considered, ethnic origin, future environment, plans for type of practice, academic and otherwise, were posed.

B. The Otolaryngologist-in-Research. Leader — Dr. J. Tonndorf

Only 96 responding questionnaires were available for evaluation. It was found that the definition of research by the respondents created a problem. Further efforts will be made by an addition to the survey in order to prove the value of this report.

C. The Otolaryngologist-in-Teaching. Leader — Dr. J. Bordley

Directors of 106 programs were requested to answer survey questions of which 86 responded. The information obtained had to do with autonomy, numbers on staff, funding, vacancies, needs for increase or decrease in the staff, etc.

D. The Otolaryngologist-in-Practice. Leader — Dr. Paul Keller

There are estimated to be 5,655 practicing otolaryngologists in the United States. Information was obtained from 2,735. The questions had to do with age, numbers within various states, population areas, continuing education, self-evaluation, type of practice and hospital base. It was interesting that in this group there were 11 blacks and 17 females. Five hundred fourteen respondents were not certified.

A session involving general discussion and critique was held and entered into by a number of those present, including your representative. The meeting was completed at the designated time. Dr. Murry Goldstein of NIH was among those present.

In summary it is obvious that a tremendous amount of data has been accumulated as a result of this survey. Much should be relevant as far as manpower specifically and generally is concerned. That which may be considered irrelevant will nonetheless be of interest. Future health care should profit from this endeavor.

The report in full with summaries and conclusions will be forthcoming in the near future.

Respectfully submitted,

G. S. Fitz-Hugh, M.D.

ALA Representative

(This report was duly accepted by the Fellows.)

REPORT OF THE NOMINATING COMMITTEE

The Nominating Committee met yesterday and is happy to submit the following slate for consideration for members of the Council for the year 1974-75:

Daniel C. Baker, Jr., M.D.

Charles F. Ferguson, M.D.

Joseph H. Ogura, M.D.

DeGraaf Woodman, M.D.

Douglas P. Bryce, M.D.

F. Johnson Putney, M.D.

John F. Daly, M.D.

Frank D. Lathrop, M.D.

Charles M. Norris, M.D.

G. Slaughter Fitz-Hugh, M.D.

Respectfully submitted,

Francis W. Davison, M. D., Chairman

(This report was duly accepted by the Fellows.)

THIRD EXECUTIVE SESSION

SATURDAY, APRIL 27, 1974

The Business Meeting of the Ninety-fifth Annual Meeting of the American Laryngological Association reconvened at 11:42 A.M., President G. Slaughter Fitz-Hugh presiding.

PRESIDENT FITZ-HUGH: I would like to call the executive session to order.

You have heard from the Nominating Committee and now we must elect this group as the Board of Directors and I would like to have a motion to that effect.

We have our motion which is entirely unanimous and the Secretary is instructed to note that.

(Whereupon there followed the organizational meeting of the Board of Directors.)

SECRETARY DALY: Mr. President, the Board of Directors has met and they have elected the officers for the coming year 1974-1975. They are the following: for President, Dr. Daniel Baker; First Vice-President, Dr. Joseph Ogura; Second Vice-President, Dr. Douglas Bryce; Secretary, Dr. Daly; Treasurer, Dr. Norris; Librarian, Historian and Editor, Dr. Ferguson; First Councilor, Dr. Woodman; Second Councilor, Dr. Putney; Third Councilor, Dr. Lathrop; Fourth Councilor, Dr. Fitz-Hugh. This completes the report from the Board of Directors.

PRESIDENT FITZ-HUGH: Before the installation of the new President, I would like to take this opportunity of thanking the Secretary and Vice-Presidents, the Council and the Fellows for their cooperation in the past year.

There is no question of the honor you have bestowed upon me and I will always consider this one of the high points in my career.

Now, if Dr. Clerf and Dr. LeJeune would be kind enough to escort the new President to this august station here . . .

(Whereupon Dr. Clerf and Dr. LeJeune then escorted the newly elected President up to the podium.)

And, I take great pleasure in turning the gavel over to you for the coming year and I trust and I know you will have the cooperation I have had and your year will be a pleasurable one for you.

PRESIDENT BAKER: Thank you, Slaughter. Now, Slaughter, before you leave, my first duty as President is to present you with the Presidential Key and I might say that with this goes certainly my appreciation, and I am sure that of all the members of the Association including the guests, for the wonderful program you have put forth. Thank you, very much.

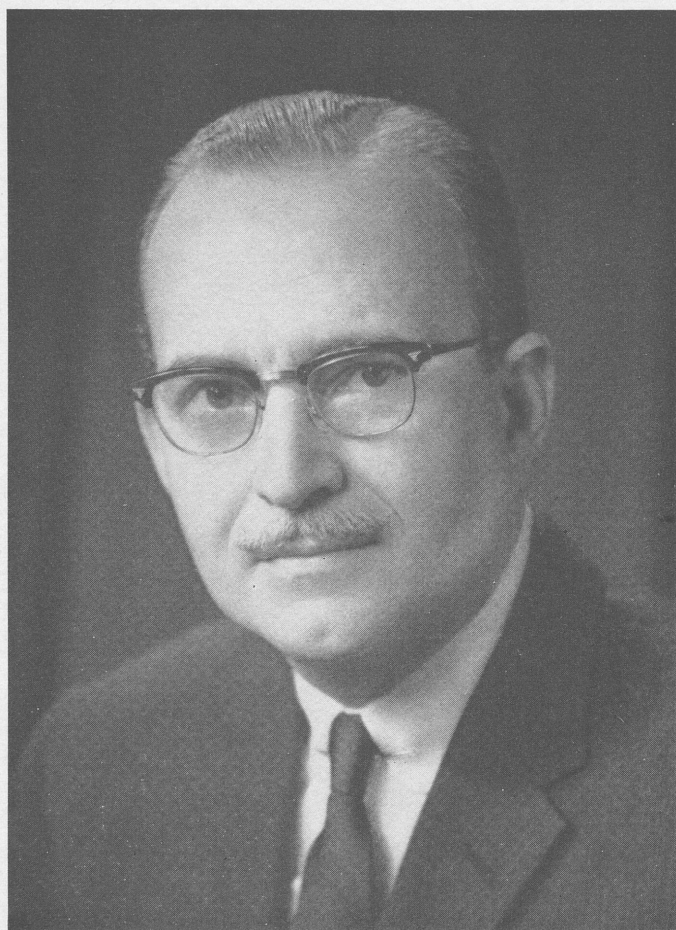
(Whereupon President Baker then presented the Presidential Key to Dr. Fitz-Hugh.)

DR. FITZ-HUGH: Very good, thank you, all.

PRESIDENT BAKER: Now, I also want to thank all of you for this very great honor that you have selected me for, for the coming year. I promise you I will pursue it and to hold this office with all of my ability. If there is no further business, this meeting is adjourned.

(The Ninety-fifth Annual Meeting adjourned at eleven-fifty o'clock.)

Memorials



VICTOR RICARDO ALFARO, M.D.

VICTOR RICARDO ALFARO, M.D.

1907 - 1974

Victor R. Alfaro of Washington, D.C., an Active Member since 1958, was killed instantly in an auto accident on April 5, 1974. He and his wife, Nancy, were driving to the Senior Society meetings in Palm Beach with four paintings to be donated to the Deafness Research Foundation. This tragic, line-of-duty accident occurred in Orangeburg, South Carolina. His wife, Nancy, was seriously but not critically injured.

He was born in Panama City, Panama, and came to this country in 1922, attending Georgetown University and graduating from the Medical School in 1929. He interned in Panama and began the study of otolaryngology at the Graduate School of the University of Pennsylvania in 1931. Later training followed in laryngology and bronchoesophagology at the Chevalier Jackson Clinic in 1943 and endaural surgery at Northwestern University in 1951. Victor was on the faculty of Georgetown University, rising from instructor in 1931 to professor from 1949 to 1961, and was professor emeritus at this institution at the time of his death. He had been senior surgeon at the Episcopal Ear, Eye and Throat Hospital and remained on the senior advisory staff of the Washington Hospital Center.

He rose from Captain, Medical Corps, to Lieutenant Colonel at the time of his discharge in 1946, having been stationed in Atlantic City and the Canal Zone.

Locally he was active in the Medical Society of the District of Columbia, having been variously delegate, president, and chairman of the executive board. He served as chairman of the AMA Section of Otolaryngology, Rhinology and Laryngology in 1959. Victor was perhaps best known for his activity in the Triological Society of which he was Secretary from 1962-1968, Guest of Honor in 1970, and President in 1971-72. Other memberships included the American Otological Society since 1954 and the American Society of O. and O. Allergy. He had been a delegate for the United States on the Board of Directors of the Pan American Society of Otolaryngology and was very active in international meetings. He was secretary for local arrangements of the International Congress for Otolaryngology in Washington in 1957 and Delegate for the United States to Paris in 1961 and to Tokyo in 1965. He was our delegate to the I.F.O.S. World Congress in Venice in 1973. Honorary memberships were enjoyed in Panamanian, Columbian, Uruguayan and Argentinian otolaryngology societies. Among his awards was the Vicennial Medal from Georgetown in 1951 as well as certificates of award from the Washington Metropolitan Health Council, the American Academy of O. and O. and the Triological Society. For over ten years he had been Abstract Editor of the *Annals of Otolaryngology, Rhinology and Laryngology*, and contributed frequently to the literature.

His work for the Deafness Research Foundation and the Centurion Club was characteristically great. The value from the sale of his paintings which were contributed to the Centurion Club was close to the \$11,000 mark. His meticulous still lifes were a joy to behold and sold at bargain prices for his favorite charity. Golf was his sport, played mostly at the Chevy Chase Club.

I have known him for 37 years. Handsome, scholarly, urbane, devoted to teaching and above all to otolaryngology and otolaryngologic organizations, he was a man to emulate. The hours spent on committees, councils, and other un-

heralded tasks receive little reward. Of a distinguished family, his father having been Panamanian Ambassador to the United States, President of Panama, and later Vice-President of the World Court at the Hague, he also had a famous daughter, Nancy Ames, the singer. Those of us who attended the Triological banquets at which Nancy sang could not help but share in her father's contagious warmth and pride. He is survived by his wife, Nancy, as well as a son, Ricardo J. Alfaro, II, in advertising in San Francisco, and his daughter, Mrs. J. Riviere (Nancy Ames) of Houston.

In his presidential address to the 75th Annual Meeting of The Triological Society in 1972 he told the new initiates that their new "future contributions will provide some of the threads which are forever being woven into the fabric of scientific progress in otolaryngology." It is men like Victor Alfaro who form the reinforcing fibers into which these threads are sewn.

W.M.T.

JOSEPH PRESTON ATKINS, M.D.

1909 - 1974

Joseph P. Atkins was a native of the beautiful "Pennsylvania Dutch" country of York County in mid-Pennsylvania. The son of Joseph C. and Ella Donohoe Atkins, he was born on September 16, 1909. His father, a rural physician and graduate of the University of Pennsylvania School of Medicine in 1897, established in him deep roots of the medicine and philosophy of William Osler.

He began to study medicine as a boy. Dinner table conversation impressed upon him his father's concern for the "art of medicine" and for "the patient as a human being." Traveling with his Dad by sleigh with sleigh bells and buffalo robe or by buggy or Model T gave him an early awareness of the then present diseases of typhoid, diphtheria, and a pulmonary foreign body capable of producing chronic suppuration and death.

He graduated from Dickinson College in 1930, a member of the Beta Theta Pi fraternity. During his medical school years at the University of Pennsylvania, he first developed medical perspective and a value for patient observation, graduating in the class of 1934.

Dr. Atkins interned at the Hospital of the University of Pennsylvania from 1934-1936 and did residency training in the then new cardiovascular surgery with Dr. Claude Beck from 1936-1937.

His interest and perspective in bronchoesophagology began with a preceptorship under Dr. Gabriel Tucker, Sr. at the Graduate School of Medicine at the University of Pennsylvania from 1937-1941. This culminated in the degree of Master of Science in Medicine. In 1954 he was named Clinical Professor and successor to the Gabriel Tucker Chair of Bronchoesophagology at the Graduate School of Medicine of the University of Pennsylvania, the oldest such department in the world. He was also Clinical Professor of Otolaryngology and Bronchoesophagology in the School of Medicine of the University of Pennsylvania. In 1970, he was named Professor of Otolaryngology of that School.

Joseph Atkins continued to expand, challenge and stimulate the perspective of bronchoesophagology in the same tradition of the great Philadelphia endoscopists. His particular interest in the problems of pediatric endoscopy, in the perfection of a meticulous, firm but gentle technique in the management of the child's airway, are repeatedly emphasized by his teaching of residents, personal courses and at the American Academy of Ophthalmology and Otolaryngology.

An active contributor to the literature, he participated in more than 25 scientific societies. He was a member of local, state, national and international otolaryngologic and bronchoesophagologic organizations. He served as President of the Philadelphia Laryngological Society, the Philadelphia College of Physicians, Section of Otolaryngology, the Philadelphia Bronchoscopic Club and in 1972 was President of the Pennsylvania Academy of Ophthalmology and Otolaryngology. In 1962 he was elected President of the American Bronchoesophagological Association. He was recipient of the Chevalier Jackson Award in 1969 and was again honored by that organization in 1972. Further, he was distinguished as Vice President of the American Laryngological Association in 1970.

Joseph Atkins was a devoted husband to Genevieve Knaus, whom he married



JOSEPH PRESTON ATKINS, M.D.

in 1937. They had a close, unified family of nine children, six boys and three girls, the first three of which were delivered by his father in York, Pa.

He enjoyed long-into-the-night talk sessions with his children. Although proud of all his children, no greater tribute could be paid to his role as physician and father than to realize that his eldest son is a physician, another is a medical student and a third son is a premed student. In addition, one daughter received a degree in nursing and two daughters have married physicians. Nothing pleased him more than to be able to spin a yarn or to tell a story at great length despite all obstacles.

He loved the arts, the classics, the Monday evening Philadelphia orchestra, a social gathering, to travel the world and life. He was religious, courageous and accepted adversity with optimism and without compromise in his faith.

His sense of humor, his fatherly manner, logical mind, and skillful endoscopic hands will be sorely missed.

"If there is any satisfaction to be gained by long association with the practice of medicine, it must be in the refinement of our knowledge of the needs of the patient and the perfection of our ability to meet these needs." Joseph P. Atkins, 1972.

J.A.T



CORDON D. HOOPLE, M.D.

GORDON DOUGLAS HOOPLE, M.D.

1885 - 1973

With the passing of Gordon Hoople on June 4, 1973, otolaryngology has lost one of its outstanding proponents and examples. Dr. Hoople was admired and his friendship cherished by all who came in contact with him, and the effect of his efforts in behalf of otolaryngology will have their good effects for many, many years to come.

During his lifetime, Dr. Hoople enjoyed membership in practically all national otolaryngological societies and was one of few honored by the Presidency of the American Board of Otolaryngology, the American Academy of Ophthalmology and Otolaryngology and The Triological Society. He was one of the prime motivators of The Deafness Research Foundation and for a number of years served as its Medical Advisor. In addition to his national activities in otolaryngology, Dr. Hoople was extremely active in numerous community affairs in his local community of Syracuse, New York, especially Syracuse University where he served as a Trustee from 1940 to 1967 and Chairman of the Board of Trustees from 1961 to 1967, receiving an honorary L.L.D. degree from that institution in 1967.

In addition to his numerous national and local activities and contributions, he will probably be best remembered by those who knew him for his honesty, zeal, and compassion for his patients, his students and confreres.

He will be sorely missed.

G.F.R.



PERCY EGERTON IRELAND, M.D.

PERCY EGERTON IRELAND, M.D.

1904 - 1973

Dr. Percy Egerton Ireland died on Monday, September 24, 1973. He was Professor and Chairman of the Department of Otolaryngology at the University of Toronto for almost twenty years until his retirement in 1966.

Dr. Ireland received his early education in Toronto until as a postgraduate student he studied otolaryngology under the late Dr. Mosher at Harvard Medical School. Shortly after his return to the University of Toronto and the Toronto General Hospital, he became involved in the Second World War where he served with distinction as Consultant in Otolaryngology to the Armed Services in Canada and as Advisor, Otolaryngology to the Canadian Military Headquarters in London, England from 1940-45.

After the War, he became engrossed in the field of medical education which gained for him an enviable international status and reputation. As Chairman of the Department of Otolaryngology at the University of Toronto, Percy laid the foundation for postgraduate training in otolaryngology not only in Toronto but throughout Canada. All his academic life, he worked through the Royal College of Surgeons of Canada and the Canadian Otolaryngological Society to develop a standard of excellence in the training of postgraduate students of medicine which survives and exerts its influence to this day.

His interest was not restricted to Canadian medicine but was directed in an influential way south of the border. He was chosen as a young man to serve on the American Board of Otolaryngology and continued in this influential post until his retirement. Professor Ireland was a member of all the National American Otolaryngological Societies of his time and was one time President of the American Laryngological, Rhinological and Otological Society. He was a Fellow of the Collegium Amicatum Sacrum and was widely traveled and known in Otolaryngological circles in Europe and Great Britain. He was a Life Fellow of the Academy of Medicine, Toronto.

These are the bare bones of achievement which tell nothing of the man. Percy was a warm-blooded and generous human being. His true reward is in the number of dedicated academically orientated young men he trained and influenced to be leaders in their field throughout the world. His strength was in his unselfish devotion to his students and their welfare. He gave freely of his time and counsel and he provided opportunities for his students often at his own expense. These are the essentials of a leader and few men possessed them to a greater degree.

The sympathy of the Fellows of the American Laryngological Association is extended to his wife and family.

D.P.B.



JOHN SWANN KNIGHT, M.D.

JOHN SWANN KNIGHT, M.D.

1901 - 1973

John Swann Knight, an active member of the American Laryngological Association since 1965, died on December 23, 1973 in Kansas City, where he had spent nearly his entire professional career.

While attending the University of Missouri, where he was awarded degrees of B.A. and M.A., he was also recognized as an outstanding athlete, receiving a total of seven varsity letters in four sports. In 1921 he enrolled in the School of Medicine at the University of Pennsylvania and following graduation returned for internship to the Kansas City Municipal Hospital. After further postgraduate training at the University of Pennsylvania, where he developed a special interest in bronchoesophagology under the guidance of Chevalier Jackson, he was awarded the degree of Master of Medical Science in 1929. He was among the first otolaryngologists to pursue the newly evolving techniques of middle ear surgery, including the fenestration operation of Lempert.

As a highly respected otolaryngologist and bronchoesophagologist in Kansas City, where he practiced for more than four decades, he was for twenty years chief of the services of Otorhinolaryngology and Bronchoesophagology at the Kansas City Municipal Hospital, and Clinical Professor of Otorhinolaryngology at the University of Kansas Medical Center, as well as a consultant in Otolaryngology at the University of Missouri School of Medicine. He engaged in clinical work at various times in no less than ten of the area hospitals.

Having been a 1st Lieutenant in the Army Medical Reserve Corps from 1928 to 1932, he was a Commander in the Naval Medical Corps Reserve during the Second World War. His achievements in bronchoesophagology, of which he was an ardent and energetic proponent, culminated in his election as president of the American Broncho-Esophagological Association in 1972. He was a member of a score of national and international medical organizations, including the Royal Society of Medicine and the International Broncho-Esophagological Society and made a number of significant contributions to the medical literature.

Despite a full professional career he remained an enthusiastic athlete and sportsman, with handball, golf, fishing and hunting as special interests. Other nonprofessional activities included presidency of the University of Missouri Alumni Association of Kansas City and memberships in the Society of Colonial Wars and the Military Order of the World Wars. He served on the board of governors of the Missouri chapter of the Sons of the Revolution, and was a member of the board of honorary directors of the Kansas City Art Institute. In 1930 John married Martha Bryant Callaway, to whose devotion and encouragement he credited much of his success. Also surviving are three daughters and seven grandchildren.

Apart from his professional skills and accomplishments, John was endeared to his colleagues and nonprofessional associates by his gregarious nature, his warmth of personality and a genuine kindness and consideration. Few of his contemporaries could match the energy and enthusiasm which he displayed in a full and productive career.

C.M.N.



FRANCIS LOEFFLER LEDERER, M.D.

FRANCIS LOEFFLER LEDERER, M.D.

1898 - 1973

Francis Loeffler Lederer, Professor Emeritus, was former head of the Department of Otolaryngology of the University of Illinois College of Medicine and the Illinois Eye and Ear Infirmary. He was a first generation native Chicagoan, born September 18, 1898. He died April 3, 1973. He received his B.S. degree from the University of Chicago in 1918 and his M.D. degree from Rush Medical College in 1921. After completing an internship and the beginnings of specialty training in Chicago, he married Anne Pollock, and together they visited the Universities of Berlin, Vienna, and Prague for postgraduate education in the specialty of Ear, Nose and Throat. He was certified by the American Board of Otolaryngology in 1926, just two years after its founding.

Dr. Lederer became a member of the Department of Otolaryngology of the University of Illinois in 1922 and was appointed Acting Head of the department in 1925. He rose to the rank of full Professor in 1933 and the following year was appointed Head of the department, whose growth and activities he directed as such until his retirement in 1967. His direct impact on the teaching programs of the specialty — undergraduate, graduate, and postgraduate alone is reflected in the broadened field recognized as the specialty of otorhinolaryngology today. His foresight in organizational planning with a recognition of patient needs was integrated with an analysis of the problems within the specialty. He shared his rich clinical experience with students and colleagues directly and often with humor and a quick turn of a phrase, always insisting that otorhinolaryngology maintain its position in the forefront as a specialty — without apology. All who worked with him owe him a great personal debt for his wise counsel and encouragement.

Dr. Lederer's life's work and consuming interest was his Chairmanship of the Department of Otolaryngology of the University of Illinois from the time he returned from his postgraduate studies in Europe until he was stricken with a heart attack while in his office at the University. He always prided himself on the number of second-generation otolaryngologists in the department, there being 13 at one time. His biography included citations, editorships, authorships, active and honorary society memberships too numerous to mention. His textbook, "Diseases of the Ear, Nose and Throat," became a standard reference work running to six editions; his editorial direction and coauthorship of the "Atlas of Otolaryngology and Bronchoesophagology" saw printings in six languages. Of his many awards he was probably proudest of the "Golden Apple," the teaching award presented to him three times by the students of the University of Illinois. His accuracy with a piece of chalk arched over the first few rows of a class to the head of a dozing student, was legendary. He used real showmanship without inhibitions, in emphasizing a point he felt compelled to get across.

Dr. Lederer was a Private in the Marine Corps in World War I and a Commander in the Navy in World War II, receiving the Navy Commendation Ribbon for the organization and administration of the first Rehabilitation Program for the Blind and Hard-of-Hearing. His Navy experience took him through a crash landing in the African jungle, and over the Hump to China before he established that Rehabilitation Program in Philadelphia. He received Presidential Citations from Presidents Truman, Eisenhower, and Kennedy, the Navy and the Air Force. He had a profound influence on the course of otolaryngology in the University,

in national specialty societies, and in the government, where he was consultant to the Surgeon General of the Air Force, and for many years civilian consultant to the Veterans Administration. He was a Director of the American Board of Otolaryngology, serving in this capacity until his death. He accepted the responsibility of conducting the examinations of the Board through the facilities of the Infirmary and the University for so many years that the Illinois Eye and Ear Infirmary became synonymous in the minds of many young otolaryngologists with this significant final evaluation of their education and training in the specialty. As President of the American Academy of Ophthalmology and Otolaryngology he received the full recognition of his peers for his scientific and educational achievements.

The new building housing the Eye and Ear Infirmary of the University of Illinois is, in a sense, a memorial to Dr. Lederer. From the time he was appointed Acting head, then Head of the Department at the University, and 12 years later when he became Director of the Otolaryngological service of the Infirmary in 1946, by appointment of the Governor of the State of Illinois, the Hon. Dwight Greene, he devoted his energies to bringing the two institutions together. He constantly maintained that through the broad associations of the specialty with general medicine and surgery he could provide better patient care and unified teaching and research programs. Once the organizational pattern was completed, his efforts were directed toward the concept of a modern eye, ear, nose and throat hospital on the campus of the University. Working first through the Department of Public Welfare and then the State of Illinois Department of Children and Family Services, these efforts were culminated in the dedication of the hospital and clinic in 1965, just two years before Dr. Lederer's retirement.

Included in the Infirmary is another aspect of the character of Dr. Lederer and Mrs. Lederer and reflected in their son, Francis, and his family: a chapel with a tablet next to its door which reads, "Dedicated to the memory of the parents of Anne Pollock Lederer and Francis Loeffler Lederer and in recognition of those who served this institution so successfully." He, of all those who so served, was most successful and most dedicated in that service.

P.H.H.

BENEFACTORS

DR. JOHN F. BARNHILL	DR. & MRS. GEORGE E. HOURN
DR. AUGUST L. BECK	DR. SAMUEL JOHNSTON
DR. GORDON BERRY	MRS. LILA FETTEROLF KENNEDY
DR. EDWIN N. BROYLES	DR. JAMES E. NEWCOMB
DR. WILLIAM E. CASSELBERRY	DR. HENRY B. ORTON
DR. LOUIS H. CLERF	DR. & MRS. LYMAN G. RICHARDS
DR. CORNELIUS G. COAKLEY	DR. SAMUEL SALINGER
DR. SEYMOUR R. COHEN	DR. SAM H. SANDERS
DR. & MRS. FRANCIS W. DAVISON	DR. HARRY P. SCHENCK
DR. & MR. LEE WALLACE DEAN	DR. BURT R. SHURLY
DR. ARTHUR W. DEROALDES	MR. LESTER T. SUNDERLAND
DR. FRED W. DIXON	DR. H. MARSHALL TAYLOR
DR. WILLIAM E. GROVE	DR. WALTER H. THEOBALD
DR. GORDON F. HARKNESS	DR. DEGRAAF WOODMAN
DR. FREDERICK T. HILL	



Obverse of the deRoaldes medal

RECIPIENTS OF THE DEROALDES AWARD

- 1928. DR. CHEVALIER JACKSON
- 1931. DR. D. BRYSON DELAVAN
- 1934. DR. HARRIS P. MOSHER
- 1937. DR. LEE WALLACE DEAN
- 1943. DR. RALPH A. FENTON
- 1949. DR. GEORGE M. COATES
- 1951. DR. ARTHUR W. PROETZ
- 1954. DR. LOUIS H. CLERF
- 1959. DR. ALBERT C. FURSTENBERG
- 1960. DR. DEAN M. LIERLE
- 1961. DR. FREDERICK T. HILL
- 1966. DR. PAUL H. HOLINGER
- 1970. DR. FRANCIS E. LEJEUNE
- 1973. DR. LAWRENCE R. BOIES

RECIPIENTS OF THE CASSELBERRY AWARD

1923. DR. GEORGE FETTEROLF AND DR. HERBERT FOX
1928. DR. RALPH A. FENTON AND DR. O. LARSELL
1929. DR. RICHARD A. KERN AND DR. HARRY P. SCHENCK
1929. DR. EDWARD H. CAMPBELL
1931. DR. ARTHUR W. PROETZ
1934. DR. ANDERSON C. HILDING
1936. DR. FRANCIS E. LEJEUNE: DR. JOEL J. PRESSMAN
1939. DR. H. MARSHALL TAYLOR: DR. BRIEN T. KING
1940. DR. FRENCH K. HANSEL
1941. DR. NOAH D. FABRICANT
1946. DR. PAUL H. HOLINGER
1949. DR. HENRY B. ORTON
1962. DR. HANS VON LEDEN
1966. DR. JOHN A. KIRCHNER AND MR. BARRY D. WYKE
1968. DR. JOSEPH H. OGURA

RECIPIENTS OF THE NEWCOMB AWARD

- 1941. DR. BURT R. SHURLY
- 1942. DR. FRANCIS R. PACKARD
- 1943. DR. GEORGE M. COATES
- 1944. DR. CHARLES J. IMPERATORI
- 1947. DR. HARRIS P. MOSHER
- 1948. DR. GORDON BERRY
- 1949. DR. GORDON B. NEW
- 1950. DR. H. MARSHALL TAYLOR
- 1951. DR. JOHN D. KERNAN
- 1952. DR. WILLIAM J. McNALLY
- 1953. DR. FREDERICK T. HILL
- 1954. DR. HENRY B. ORTON
- 1955. DR. THOMAS C. GALLOWAY
- 1956. DR. DEAN M. LIERLE
- 1957. DR. GORDON F. HARKNESS
- 1958. DR. ALBERT C. FURSTENBERG
- 1959. DR. HARRY P. SCHENCK
- 1960. DR. JOEL J. PRESSMAN
- 1961. DR. CHEVALIER L. JACKSON
- 1962. DR. PAUL H. HOLINGER
- 1963. DR. FRANCIS E. LEJEUNE
- 1964. DR. FRED W. DIXON
- 1965. DR. EDWIN N. BROYLES
- 1966. DR. LYMAN G. RICHARDS
- 1967. DR. JOSEPH H. OGURA
- 1968. DR. WALTER P. WORK
- 1969. DR. JOHN A. KIRCHNER
- 1970. DR. LOUIS H. CLERF
- 1971. DR. DANIEL C. BAKER, JR.
- 1972. DR. ALDEN H. MILLER
- 1973. DR. DeGRAAF WOODMAN
- 1974. DR. JOHN J. CONLEY

List of Fellows

PAST OFFICERS

Presidents

(Year of Election)

1879.	Louis Elsberg	1909.	J. E. Logan
1880.	J. Solis-Cohen	1910.	D. Braden Kyle
1881.	F. I. Knight	1911.	James E. Newcomb
1882.	G. M. Lefferts	1912.	George A. Leland
1883.	F. H. Bosworth	1913.	Thomas Hubbard
1884.	E. L. Shurly	1914.	Alexander W. MacCoy
1885.	Harrison Allen	1915.	G. Hudson Makuen
1886.	E. Fletcher Ingals	1916.	Joseph L. Goodale
1887.	R. P. Lincoln	1917.	Thomas H. Halstead
1888.	E. C. Morgan	1918.	Cornelius G. Coakley
1889.	J. N. Mackenzie	1919.	Norval H. Pierce
1890.	W. C. Glasgow	1920.	Harris P. Mosher
1891.	S. W. Langmaid	1921.	Harmon Smith
1892.	M. J. Asch	1922.	Emil Mayer
1893.	D. Bryson Delavan	1923.	J. Payson Clark
1894.	J. O. Roe	1924.	Lee Wallace Dean
1895.	W. H. Daly	1925.	Greenfield Sluder
1896.	C. H. Knight	1926.	Chevalier Jackson
1897.	T. R. French	1927.	D. Bryson Delavan
1898.	W. E. Casselberry	1928.	Charles W. Richardson
1899.	Samuel Johnston	1929.	Lewis A. Coffin
1900.	H. L. Swain	1930.	Francis R. Packard
1901.	J. W. Farlow	1931.	George E. Shambaugh
1902.	J. H. Bryan	1932.	George Fetterolf
1903.	J. H. Hartman	1933.	George M. Coates
1904.	C. C. Rice	1934.	Dunbar Roy
1905.	J. W. Gleitsman	1935.	Burt R. Shurly
1906.	A. W. deRoaldes	1936.	William B. Chamberlain
1907.	H. S. Birkett	1937.	John F. Barnhill
1908.	A. Coolidge, Jr.	1938.	George B. Wood

1939. James A. Babbitt	1958. Fred W. Dixon
1940. Gordon Berry	1959. William J. McNally
1941. Thomas E. Carmody	1960. Edwin N. Broyles
1942-3. Charles J. Imperatori	1961. Dean M. Lierle
1944-5. Harold I. Lillie	1962. Francis E. LeJeune
1946. Frank R. Spencer	1963. Anderson C. Hilding
1947. Arthur W. Proetz	1964. Albert C. Furstenberg
1948. Frederick T. Hill	1965. Paul H. Holinger
1949. Ralph A. Fenton	1966. Joel J. Pressman
1950. Gordon B. New	1967. Lawrence R. Boies
1951. H. Marshall Taylor	1968. Francis W. Davison
1952. Louis H. Clerf	1969. Alden H. Miller
1953. Gordon F. Harkness	1970. DeGraaf Woodman
1954. Henry B. Orton	1971. F. Johnson Putney
1955. Bernard J. McMahon	1972. Frank D. Lathrop
1956. LeRoy A. Schall	1973. G. Slaughter Fitz-Hugh
1957. Harry P. Schenck	

Vice-Presidents

1879. F. H. Davis	J. O. Roe
1880. W. C. Glasgow	W. Porter
1881. E. L. Shurly	E. F. Ingals
1882. C. Seiler	S. Johnston
1883. S. W. Langmaid	W. H. Daly
1884. J. H. Hartman	G. W. Major
1885. H. A. Johnson	J. N. Mackenzie
1886. E. C. Morgan	S. W. Langmaid
1887. J. N. Mackenzie	C. E. DeM. Sajous
1888. W. C. Glasgow	C. E. Bean
1889. F. Holden	J. H. Hartman
1890. J. O. Roe	S. Johnston
1891. M. J. Asch	J. C. Mulhall
1892. S. Johnston	W. E. Casselberry
1893. J. C. Mulhall	S. H. Chapman
1894. C. C. Rice	A. W. deRoaldes
1895. J. Wright	D. N. Rankin
1896. T. M. Murray	H. S. Birkett
1897. A. W. MacCoy	F. W. Hinkel
1898. J. W. Farlow	M. R. Brown
1899. T. A. DeBlois	

1900.	H. L. Wagner	A. A. Bliss
1901.	J. W. Gleitsmann	D. Braden Kyle
1902.	G. A. Leland	T. Melville Hardie
1903.	J. H. Lowman	W. Peyre Porcher
1904.	Thomas Hubbard	W. J. Freeman
1905.	J. L. Goodale	C. W. Richardson
1906.	G. H. Makuen	A. R. Thrasher
1907.	J. P. Clark	J. E. Rhodes
1908.	E. Mayer	F. R. Packard
1909.	C. G. Coakley	H. P. Mosher
1910.	Robert C. Myles	J. M. Ingersoll
1911.	F. C. Cobb	B. R. Shurly
1912.	A. W. Watson	W. Scott Renner
1913.	F. E. Hopkins	Geo. F. Shambaugh
1914.	Clement T. Theisen	Lewis A. Coffin
1915.	J. Gordon Wilson	Christian R. Holmes
1916.	Thomas H. Halsted	Greenfield Sluder
1917.	John Edwin Rhodes	D. Crosby Greene
1918.	G. E. Shambaugh	John R. Winslow
1919.	Francis R. Packard	Harmon Smith
1920.	Harmon Smith	W. B. Chamberlin
1921.	Dunbar Roy	Robert C. Lynch
1922.	George Fetterolf	Lorenzo B. Lockard
1923.	Hubert Arrowsmith	Joseph B. Greene
1924.	Ross H. Skillern	Gordon Berry
1925.	John E. Mackenty	Robert Levy
1926.	Lewis A. Coffin	William V. Mullin
1927.	Charles W. Richardson	Hill Hastings
1928.	Robert Clyde Lynch	Francis P. Emerson
1929.	William B. Chamberlin	Ralph Albert Fenton
1930.	Harris P. Mosher	James A. Babbitt
1931.	Joseph B. Greene	E. Ross Faulkner
1932.	Gordon Berry	Frank A. Spencer
1933.	E. Ross Faulkner	Thomas S. Carmody
1934.	Gordon B. New	Samuel McCullagh
1935.	Edward C. Sewall	H. Marshall Taylor
1936.	William P. Wherry	Harold I. Lillie
1937.	Frank R. Spencer	Bernard J. McMahon
1938.	Ralph A. Fenton	Frederick T. Hill
1939.	John H. Foster	Thomas R. Gittins

1940. Charles H. Porter	Gordon F. Harkness
1941. Arthur W. Proetz	Henry B. Orton
1942-3. Harold I. Lillie	Dean M. Lierle
1944-5. John J. Shea	Thomas C. Galloway
1946. H. Marshall Taylor	C. Stewart Nash
1947. John J. Shea	Frederick A. Figi
1948. Henry B. Orton	Anderson C. Hilding
1949. LeRoy A. Schall	Fletcher D. Woodward
1950. W. Likely Simpson	Lyman G. Richards
1951. Wm. J. McNally	Thomas C. Galloway
1952. J. Mackenzie Brown	Edwin N. Broyles
1953. Claude C. Cody	Daniel S. Cuning
1954. James H. Maxwell	Clyde A. Heatly
1955. Robert L. Goodale	Paul H. Holinger
1956. Henry M. Goodyear	Robert E. Priest
1957. Francis E. LeJeune	Pierre P. Viole
1958. Charles Blassingame	Chevalier L. Jackson
1959. James Maxwell	Oliver Van Alyea
1960. Walter Theobald	Anderson Hilding
1961. Julius W. McCall	P. E. Ireland
1962. Paul M. Moore	Jerome A. Hilger
1963. Paul M. Holinger	Lester A. Brown
1964. G. Slaughter Fitz-Hugh	Daniel C. Baker
1965. C.E. Munoz-MacCormick	Arthur J. Cracovaner
1966. Lawrence R. Boies	G. Edward Tremble
1967. John F. Daly	Stanton A. Friedberg
1968. DeGraaf Woodman	John Murtagh
1969. Joseph P. Atkins	Stanton A. Friedberg
1970. Robert B. Lewy	Oliver W. Suehs
1971. James A. Harrill	James D. Baxter
1972. Francis L. Weille	Sam H. Sanders
1973. William H. Saunders	Blair Fearon

Secretaries and Treasurers

1879. G. M. Lefferts	1895. H. L. Swain
1882. D. Bryson Delavan	1900. P. E. Newcomb
1889. C. H. Knight	1911. Harmon Smith

Secretaries

1912.	Harmon Smith	1942.	Arthur W. Proetz
1918.	D. Bryson Delavan	1947.	Louis H. Clerf
1919.	J. M. Ingersoll	1952.	Harry P. Schenck
1920.	George M. Coates	1957.	James H. Maxwell
1933.	William V. Mullin	1959.	Lyman G. Richards
1935.	James A. Babbitt	1968.	Frank D. Lathrop
1939.	Charles J. Imperatori	1972.	John F. Daly

Treasurers

1912.	J. Payson Clark	1939.	Frederick T. Hill
1923.	George Fetterolf	1948.	Gordon F. Harkness
1932.	William V. Mullin	1953.	Fred W. Dixon
1933.	James A. Babbitt	1958.	Francis E. LeJeune
1935.	Charles J. Imperatori	1962.	Alden H. Miller
	1969.	Charles M. Norris	

Librarians

1879.	F. H. Bosworth	1930.	John F. Barnhill
1883.	T. R. French	1934.	Burt R. Shurly
1903.	J. H. Bryan	1935.	George M. Coates

Librarian and Historian

1936.	George M. Coates	1944.	Louis H. Clerf
-------	------------------	-------	----------------

Librarian, Historian and Editor

1947.	Harry P. Schenck	1960.	Francis W. Davison
1952.	Bernard J. McMahon	1964.	F. Johnson Putney
1955.	Edwin N. Broyles	1971.	Charles F. Ferguson

PAST FELLOWS

Dates indicate original election to the Association

**Deceased*

Honorary Fellows

- *1908. Barnhill, John F., Miami Beach, Florida.
- *1893. Birkett, Herbert S., Montreal, Canada.
- *1878. Bosworth, Francke H., New York, N. Y.
- *1917. Coates, George M., Philadelphia, Pa.
- *1918. Dean, Lee Wallace, St. Louis, Mo.
- *1881. Delavan, D. Bryson, New York, N. Y.
- *1893. deRoaldes, Arthur W., New Orleans, La.
- *1890. De La Sota Y. Lastra, Ramon, Seville, Spain.
- *1923. Fenton, Ralph A., Portland, Oregon.
- *1879. French, Thomas R., Brooklyn, N. Y.
- *1880. Garcia, Senior Manuel, London, England.
- *1903. Harris, Thos J., New York, N. Y.
- *1928. Hill, Frederick T., Waterville, Me.
- *1907. Jackson, Chevalier, Schwenksville, Pa.
- *1878. Johnston, Samuel, Baltimore, Md.
- *1878. Lefferts, George Morewood, Katonah, N. Y.
- *1914. Levy, Robert, Denver, Colo.
- *1918. Lewis, Fielding O., Media, Pa.
- *1883. Mackenzie, John N., Baltimore, Md.
- *1881. Mackenzie, Sir Morel, London, England.
- *1910. Masser, Ferdinand, Naples, Italy.
- *1904. Mosher, Harris P., Marblehead, Mass.
- *1910. Moure, J. J. E., Bordeaux, France.
- *1937. Nager, F. R., Zurich, Switzerland.
- *1918. Oliver, H. K., Boston, Mass.
- *1906. Pierce, Norval Harvey, San Diego, Calif.
- *1924. Proetz, Arthur C., St. Louis, Mo.
- *1909. Semon, Sir Felix, Great Missenden, England.
- *1878. Solis-Cohen, J., Philadelphia, Pa.

- *1889. Swain, Henry L., New Haven, Conn.
- *1914. Thomson, Sir St. Clair, London, Eng.
- *1903. Tilley, Herbert, London, England.
- *1914. Wagner, Clinton, New York, N. Y.
- *1890. Wright, Jonathan, Pleasantville, N. Y.

Corresponding Fellows

- *1892. Browne, Lennox, London, England.
- *1938. Blair, Vilray P., St. Louis, Missouri.
- *1968. Cawthorne, Sir Terence, London, England.
- *1940. Colledge, Lionel, London, England.
- *1901. Collier, Mayo, Kearsney, Abbey, Kent, England.
- *1893. Desvernine, Carlos M., Havana, Cuba.
- *1930. Emerson, Francis P., Franklin, Mass.
- *1943. Eggston, Andrew A., New York, N. Y.
- *1961. Faaborg-Andersen, Knud, Nykobing, Denmark.
- *1936. Fraser, John S., Edinburgh, Scotland.
- *1901. Grant, Sir James Dundas, London, England.
- *1887. Cougenheim, A., Paris, France.
- *1894. Holden, Edgar, Newark, N. J.
- *1919. Kelly, Adam Brown, Helensburgh, Scotland.
- *1881. Labus, Carlo, Milan, Italy.
- *1950. Larsell, Olof, Portland, Oregon.
- *1931. LaSagna, Francesco, Parma, Italy.
- *1926. Law, Frederick M., New York, N. Y.
- *1921. LeMaitre, Ferdinand, Paris, France.
- *1902. Lermoyez, Marcel, Paris, France.
- *1897. Luc, H., Paris, France.
- *1896. MacDonald, Greville, Haslemere, Surrey, England.
- *1894. MacIntyre, John, Glasgow, Scotland.
- *1903. McBride, P., York, England.
- *1920. McKenzie, Dan, London, England.
- *1919. McKernon, James F., New Canaan, Conn.
- *1880. Meyer, Wilhelm, Copenhagen, Denmark.
- *1910. Moure, J. J. E., Bordeaux, France.
- *1896. Mygind, Holger, Copenhagen, Denmark.
- *1950. Neil, James Hardie, Auckland, New Zealand.

- *1919. Paterson, Donald Rose, Cardiff, Wales.
- *1941. Patterson, Norman, Herts, England.
- *1919. Rogers, John, Jr., New York, N. Y.
- *1894. Sajous, C. E. DeM., Philadelphia, Pa.
- *1924. Schaefer, J. Parson, Philadelphia, Pa.
- *1896. Schmiegelow, Ernst, Copenhagen, Denmark.
- *1946. Segura, Eliseo, Buenos Aires, Argentina.
- *1940. Soto, E. Fernandez, Havana, Cuba.
- *1881. Thornton, Pugin, London, England.
- *1913. Turner, A. Logan, Edinburgh, Scotland.
- *1880. Whistler, W. McNeil, London, England.
- *1901. Wingrave, Wyatt, Lyme Regis, Dorset, England.
- *1894. Wolfenden, R. Norris, Kent, England.

Emeritus Fellows

- *1936. Ballenger, Howard C., Winnetka, Ill.
- *1923. Barlow, Roy A., Nova Scotia, Canada.
- *1915. Barnes, Harry Aldrich, Kingston, Mass.
- *1944. Beatty, Hugh G., Columbus, Ohio
- *1928. Beck, Joseph C., Chicago, Illinois.
- *1921. Berry, Gordon, Worcester, Mass.
- *1941. Bowers, Wesley C., New York, N. Y.
- *1901. Brown, J. Price, Toronto, Canada.
- *1891. Bryan, Joseph H., Washington, D. C.
- *1913. Butler, Ralph, Philadelphia, Pa.
- *1930. Campbell, Edward H., Philadelphia, Pa.
- *1897. Clark, J. Payson, Boston, Mass.
- *1899. Cobb, Frederick C., Bradenton, Florida.
- *1939. Cody, Claude C., Jr., Houston, Texas.
- *1905. Coffin, Lewis A., New York, N. Y.
- *1893. Coolidge, Algernon, Boston, Mass.
- *1937. Crowe, Samuel J., Baltimore, Maryland.
- *1941. Cunning, Daniel S., New York, N. Y.
- *1913. Dabney, Virginia, Washington, D. C.
- *1882. De Blois, Thomas Amory, Boston, Mass.
- *1941. Dixon, Fred W., Shaker Heights, Ohio.
- *1892. Farlow, John W. Boston, Mass.
- *1930. Figi, Frederick A., Rochester, Minn.
- *1922. Forbes, Henry H., New York, N. Y.

- *1933. Foster, John H., Houston, Texas.
- *1905. Freer, Otto T., Chicago, Ill.
- *1932. Furstenberg, Albert C., Ann Arbor, Mich.
- *1940. Gatewood, E. Tribble, Richmond, Va.
- *1928. Gittins, Thomas R., Sioux City, Iowa.
- *1880. Gleitsmann, Joseph W., New York, N. Y.
- *1922. Goldsmith, Perry G., Toronto, Canada.
- *1898. Goodale, Joseph L., Ipswich, Mass.
- *1932. Graham, Harrington B., San Francisco, California.
- *1906. Greene, D. Crosby, Jr., Boston, Mass.
- *1917. Greene, Joseph B., Asheville, N. C.
- *1950. Hall, Colby, Encino, Calif.
- *1905. Halsted, Thomas H., Los Angeles, Calif.
- *1896. Hardie, Thomas Melville, Chicago, Ill.
- *1959. Hart, Verling K., Charlotte, N. C.
- *1915. Hastings, Hill, Los Angeles, Calif.
- *1944. Havens, Fred Z., Rochester, Minn.
- *1888. Hinkel, Frank Whitehill, Buffalo, New York.
- *1944. Hoople, Gordon D., Syracuse, N. Y.
- *1895. Hopkins, Frederick E., Springfield, Mass.
- *1930. Houser, Karl M., Ardmore, Pa.
- *1927. Hubbard, Thomas, Toledo, Ohio.
- *1919. Hurd, Lee Maidment, Rowayton, Conn.
- *1920. Imperatori, Charles J., Essex, N. Y.
- *1904. Ingersoll, John Marvin, Miami, Fla.
- *1952. Ireland, Percy E., Toronto, Canada
- *1928. Jarvis, DeForest C., Barre, Vt.
- *1939. Johnston, Willam H., Santa Barbara, Calif.
- *1942. Kelly, Joseph D., New York, N. Y.
- *1918. Kenyon, Elmer L., Chicago, Ill.
- *1921. Kernan, John D., New York, N. Y.
- *1929. Kistner, Frank B., Portland, Oregon.
- *1885. Knight, Charles H., New York, N. Y.
- *1939. Large, Secord H., Cleveland, Ohio.
- *1894. Leland, George A., Boston, Mass.
- *1922. Lillie, Harold I., Rochester, Minn.
- *1943. Lincoln, William R., Cleveland, Ohio.
- *1928. Lyman, Harry Webster, St. Louis, Mo.

- *1886. MacCoy, Alexander W., Philadelphia, Pa.
- *1941. Martin, Robert C., San Francisco, Calif.
- *1896. Mayer, Emil, New York, N. Y.
- *1951. McCart, Howard W. D., Toronto, Canada.
- *1939. McCaskey, Carl H., Indianapolis, Indiana.
- *1943. McCullagh, Samuel, New York, N. Y.
- *1923. McKinney, Richmond, Memphis, Tenn.
- *1933. McMahon, Bernard J., St. Louis, Mo.
- *1928. MacPherson, Duncan, New York, N. Y.
- *1939. Myers, John L., Kansas City, Mo.
- *1901. Myles, Robert C., New York, N. Y.
- *1937. Nash, C. Stewart, Rochester, N. Y.
- *1922. New, Gordon B., Rochester, Minn.
- *1923. Newhart, Horace, Minneapolis, Minn.
- *1903. Packard, Francis R., Philadelphia, Pa.
- *1878. Porter, William, Ocean Springs, Miss.
- *1942. Potts, John B., Omaha, Nebr.
- *1903. Renner, W. Scott, Buffalo, N. Y.
- *1897. Rhodes, John Edwin, Chicago, Ill.
- *1884. Rice, Clarence C., New York, N. Y.
- *1905. Richards, George L., South Yarmouth, Mass.
- *1878. Robinson, Beverly, New York, N. Y.
- *1921. Sauer, William E., St. Louis, Mo.
- *1923. Sewall, Edward C., Palo Alto, Calif.
- *1930. Seydell, Ernest M., Wichita, Kansas.
- *1907. Shambaugh, George E., Chicago, Ill.
- *1908. Smith, Harmon, New York, N. Y.
- *1923. Spencer, Frank R., Boulder, Colo.
- *1927. Tobey, Harold G., Boston, Mass.
- *1925. Tucker, Gabriel, Haverford, Pa.
- *1892. Wagner, Henry L., San Francisco, Calif.
- *1892. Watson, Arthur W., Philadelphia, Pa.
- *1948. Whalen, Edward J., Hartford, Conn.
- *1922. White, Francis W., New York, N. Y.
- *1939. Wilson, J. Gordon, Old Bennington, Vt.
- *1905. Wood, George B., Wynnewood, Pa.
- *1935. Woodward, Fletcher D., Charlottesville, Va.

Active Fellows

- *1958. Alfaro, Victor R., Washington, D. C.
- *1880. Allen, Harrison, Philadelphia, Pa.
- *1917. Arrowsmith, Hubert, Brooklyn, N. Y.
- *1879. Asch, Morris J., New York, N. Y.
- *1942. Ashley, Rae E., San Francisco, Calif.
- *1958. Atkins, Joseph P., Philadelphia, Pa.
- *1923. Babbitt, James A., Philadelphia, Pa.
- *1906. Ballenger, William L., Chicago, Ill.
- *1880. Bean, C. E., St. Paul, Minn.
- *1949. Beck, August L., New Rochelle, N. Y.
- *1904. Berens, T. Passmore, New York, N. Y.
- *1924. Bigelow, Nolton, Providence, R. I.
- *1938. Blassingame, Charles D., Memphis, Tenn.
- *1893. Bliss, Arthur Ames, Philadelphia, Pa.
- *1951. Boyden, Guy L., Portland, Oregon.
- *1895. Boylan, J. E., Cincinnati, Ohio.
- *1932. Brown, John Mackenzie, Los Angeles, Calif.
- *1892. Brown, Moreau R., Chicago, Ill.
- *1933. Buckley, Robert E., New York, N. Y.
- *1915. Canfield, R. Bishop, Ann Arbor, Mich.
- *1934. Carmack, John Walter, Indianapolis, Ind.
- *1924. Carmody, Thomas E., Denver, Colo.
- *1889. Casselberry, William E., Chicago, Ill.
- *1883. Chamberlain, C. W., Hartford, Conn.
- *1917. Chamberlin, William B., Cleveland, Ohio.
- *1896. Chappell, W. F., New York, N. Y.
- *1882. Chapman, S. Hartwell, New Haven, Conn.
- *1902. Coakley, Cornelius G., New York, N. Y.
- *1913. Coffin, Rockwell C., Boston, Mass.
- *1918. Cox, Gerald H., New York, N. Y.
- *1880. Cushing, E. W., Boston, Mass.
- *1878. Cutter, Ephraim, West Falmouth, Mass.
- *1880. Daly, W. H., Pittsburgh, Pa.
- *1878. Davis, F. H., Chicago, Ill.
- *1941. Davis, Warren B., Philadelphia, Pa.
- *1926. Dennis, Frank Lownes, Colorado Springs, Colo.
- *1901. Dickerman, E. T., Chicago, Ill.
- *1878. Donaldson, Frank, Baltimore, Md.
- *1947. Engler, Clarence W., Cleveland, Ohio.

- *1954. Equen, Murdock S., Atlanta, Ga.
- *1935. Eves, Curtis C., Philadelphia, Pa.
- *1919. Faulkner, E. Ross, New York, N. Y.
- *1914. Fetterolf, George, Philadelphia, Pa.
- *1901. Freeman, Walter J., Philadelphia, Pa.
- *1917. Friedberg, Stanton A., Chicago, Ill.
- 1940. Fuchs, Valentine H., New Orleans, La.
- *1897. Frothingham, Richard, New York, N. Y.
- *1909. Getchell, Albert C., Worcester, Mass.
- *1907. Gibb, Joseph S., Philadelphia, Pa.
- *1940. Gill, William D., San Antonio, Texas.
- *1878. Glasgow, William Carr, St. Louis, Mo.
- *1913. Goldstein, Max A., St. Louis, Mo.
- *1905. Grayson, Charles P., Philadelphia, Pa.
- *1934. Grove, William E., Milwaukee, Wisconsin.
- *1933. Harkness, Gordon F., Davenport, Iowa.
- *1878. Hartman, J. H., Baltimore, Md.
- *1945. Hickey, Harold L., Denver, Colo.
- *1879. Holden, Edgar, Newark, N. J.
- *1907. Holmes, Christian R., Cincinnati, Ohio.
- *1882. Hooper, Franklin H., Boston, Mass.
- *1893. Hope, George B., New York, N. Y.
- *1938. Hourn, George E., St. Louis, Mo.
- *1939. Hunt, Westley Marshall, New York, N. Y.
- *1901. Hyatt, Frank, Washington, D. C.
- *1925. Iglauer, Samuel, Cincinnati, Ohio.
- *1878. Ingals, E. Fletcher, Chicago, Ill.
- *1882. Ives, Frank L., New York, N. Y.
- *1938. Jackson, Chevalier L., Philadelphia, Pa.
- *1880. Jarvis, William C., New York, N. Y.
- *1878. Johnson, Hosmer A., Chicago, Ill.
- *1879. Johnson, Woolsey, New York, N. Y.
- *1960. Johnston, Kenneth C., Chicago, Ill.
- *1944. Jones, Marvin F., New York, N. Y.
- *1879. Kealhofer, R. H., St. Louis, Mo.
- *1964. Keim, W. Franklin, Montclair, N. J.
- *1942. King, Edward D., North Hollywood, Calif.
- *1901. King, Gordon, New Orleans, La.
- *1885. Knight, Charles H., New York, N. Y.

- *1878. Knight, Frederick Irving, Boston, Mass.
- *1965. Knight, John S., Kansas City, Mo.
- *1898. Kyle, D. Braden, Philadelphia, Pa.
- *1880. Langmaid, Samuel W., Boston, Mass.
- *1953. Lederer, Francis L., Chicago, Ill.
- *1878. Lincoln, Rufus P., New York, N. Y.
- *1911. Lockard, Lorenzo B., Denver, Colo.
- *1913. Loeb, Hanau W., St. Louis, Mo.
- *1897. Logan, James E., Kansas City, Mo.
- *1935. Looper, Edward A., Baltimore, Md.
- *1888. Lowman, John H., Cleveland, Ohio.
- *1919. Lynah, Henry L., New York, N. Y.
- *1952. Lynch, Mercer G., New Orleans, La.
- *1915. Lynch, Robert Clyde, New Orleans, La.
- *1879. McBurney, Charles, New York, N. Y.
- *1927. McGinnis, Edwin, Chicago, Ill.
- 1936. McGregor, Gregor, Toronto, Canada.
- *1913. McKimmie, O. A., Washington, D. C.
- *1945. McLaurin, John G., Dallas, Texas.
- *1885. McSherry, H. Clinton, Baltimore, Md.
- *1914. Mackenty, John E., New York, N. Y.
- *1898. Makuen, G. Hudson, Philadelphia, Pa.
- *1881. Major, G. W., Montreal, Canada.
- *1948. Maxwell, James H., Ann Arbor, Mich.
- *1954. Meltzer, Philip E., Boston, Mass.
- 1958. Montreuil, Fernand, Montreal, Canada
- *1881. Morgan, E. C., Washington, D. C.
- *1950. Morrison, Lewis F., San Francisco, Calif.
- *1940. Morrison, William W., New York, N. Y.
- *1886. Mulhall, J. C., St. Louis, Mo.
- *1925. Mullin, William V., Cleveland, Ohio.
- *1914. Munger, Carl E., Waterbury, Conn.
- *1892. Murray, T. Morris, Washington, D. C.
- *1881. Mynter, H., Buffalo, N. Y.
- *1893. Newcomb, James E., New York, N. Y.
- *1895. Nichols, J. E. H., New York, N. Y.
- *1927. Orton, Henry B., Newark, N. J.
- *1894. Park, William H., New York, N. Y.
- *1892. Porcher, W. Peyre, Charleston, S. C.

- *1927. Porter, Charles T., Boston, Mass.
- *1954. Pressman, Joel J., Los Angeles, Calif.
- *1908. Randall, B. Alexander, Philadelphia, Pa.
- *1882. Rankin, D. N., Allegheny, Pa.
- *1934. Richards, Lyman G., Wellesley Hills, Mass.
- *1902. Richardson, Charles W., Washington, D. C.
- *1930. Ridpath, Robert E., Philadelphia, Pa.
- *1879. Roe, John O., Rochester, N. Y.
- *1945. Robb, James M., Detroit, Michigan.
- *1953. Roberts, Sam E., Kansas City, Mo.
- *1881. Robertson, J. M., Detroit, Mich.
- *1913. Roy, Dunbar, Atlanta, Ga.
- *1878. Rumbold, T. F., St. Louis, Mo.
- *1879. Seiler, Carl, Philadelphia, Pa.
- *1928. Shea, John Joseph, Memphis, Tennessee.
- *1893. Shields, Charles M., Richmond, Pa.
- *1909. Shurly, Burt R., Detroit, Mich.
- *1878. Shurly, E. L., Detroit, Mich.
- *1892. Simpson, William Kelly, New York, N. Y.
- *1919. Skillern, Ross H., Philadelphia, Pa.
- *1909. Sluder, Greenfield, St. Louis, Mo.
- *1879. Smith, Andrew H., Geneva, N. Y.
- *1932. Smyth, Duncan Campbell, Boston, Mass.
- *1928. Sonnenschein, Robert, Chicago, Ill.
- *1924. Stein, Otto J., Chicago, Ill.
- 1934. Stevenson, Walter, Quincy, Ill.
- *1911. Staut, George C., Philadelphia, Pa.
- *1879. Tauber, Bernhard, Cincinnati, Ohio.
- *1924. Taylor, Hermon Marshall, Jacksonville, Fla.
- *1903. Theisen, Clement F., Albany, N. Y.
- *1899. Thorner, Max, Cincinnati, Ohio.
- *1892. Thrasher, Allen B., Cincinnati, Ohio.
- *1937. Tobey, George L., Jr., Boston, Mass.
- *1888. Van der Poel, S. O., New York, N. Y.
- *1938. Vail, Harris H., Cincinnati, Ohio.
- *1936. Voislawsky, Antonie P., New York, N. Y.
- *1954. Walsh, Theodore E., St. Louis, Mo.
- *1933. Wanamaker, Allison T., Seattle, Wash.
- *1896. Ward, Marshall R., Pittsburgh, Pa.
- *1879. Ward, Whitfield, New York, N. Y.

- *1886. Westbrook, Benjamin F., Brooklyn, N. Y.
- *1924. Wherry, William P., Omaha, Neb.
- *1924. White, Leon E., Boston, Mass.
- *1939. Williams, Horace J., Philadelphia, Pa.
- *1942. Wishart, D. E. Staunton, Toronto, Canada.
- *1922. Wishart, David J. G., Toronto, Canada.
- *1940. Wood, V. Visscher, St. Louis, Mo.
- *1896. Wollen, Green V., Indianapolis, Ind.
- *1953. Wilkerson, William W., Nashville, Tenn.

Roster of Present Fellows

1974

LIST OF FELLOWS

Date Indicates Year Admitted to Active Fellowship

Attendance at meetings is shown by figures following each name.
Asterisk (*) indicates year paper was read.

Active Fellows

- 1962. ALEXANDER, FRED W., 3461 Warrensville Center Rd., Shaker Heights, Ohio 44122, 1962, '63*, '64, '66, '68, '69, '70, '71, '72.
- 1974. ALFORD, BOBBY R., 1200 Moursund Ave., Houston, Texas 77025, 1974.
- 1969. ANDREWS, ALBERT H. JR., 122 S. Michigan Ave., Chicago, Ill., 60603, 1970, '71, '72, '73, '74*.
- 1962. ARNOLD, GODFREY E., 2500 N. State St., Jackson, Mississippi 39216, 1962, '63*, '64*, '66, '69, '70, '72, '73.
- 1969. AUSBAND, JOHN R., Bowman Gray School of Medicine, Winston-Salem, N. C. 27103, 1970, '71, '72, '73.
- 1956. †BAKER, DANIEL CLIFTON, JR., 180 Fort Washington Ave., New York, N. Y. 10032, 1956, '57, '58, '59*, '60, '61, '62*, '63, '64, '65, '66, '69*, '70, '71*, '72*, '73, '74.
- 1970. BALLENGER, JOHN J., 723 Elm St., Winnetka, Ill. 60093, 1971, '72, '73, '74.
- 1963. BAXTER, JAMES D., 687 Pine Ave. West, Montreal, 112, Quebec, Canada, 1963, '65*, '66, '67, '68, '69, '70, '71, '72, '73, '74.
- 1955. BORDLEY, JOHN E., Johns Hopkins Hospital, Baltimore, Maryland 21205, 1955, '56, '57, '59, '60, '62, '63, '64, '65, '66, '67, '69, '70, '71, '72, '73*, '74.
- 1959. BREWER, DAVID W., 1100 E. Genesee St., Syracuse, N. Y. 13210, 1959, '60*, '61, '62*, '63*, '66, '70, '73, '74*.
- 1955. BROWN, LESTER ALEXANDER, 490 Peachtree Street, N.E., Atlanta, Georgia 30308, 1955, '56, '57, '58, '59, '61, '63, '65, '68, '69, '70, '71, '72, '73*, '74.
- 1940. BROYLES, EDWIN N., 11 East Chase St., Baltimore, Maryland 21202, 1940, '41*, '42, '46, '48*, '49, '50, '51*, '52, '53, '54, '55, '56, '58, '59*, '60, '61*, '63, '64, '65, '67, '71.

† Deceased June 2, 1974.

How

1963. BRYCE, DOUGLAS P., O.P.D. Toronto General Hospital, Toronto, Ontario, Canada, 1963*, '64, '66*, '67*, '68*, '69, '70, '71, '72, '73, '74.
1968. CHANDLER, J. RYAN, 1700 N.W. 10th Ave., Miami, Fla. 33136, 1968, '69*, '70, '71, '72, '73, '74.
1967. COCKE, EDWIN W., JR., 899 Madison, Memphis, Tenn. 38102, 1967, '68, '69, '70, '72, '74.
1964. CODY, CLAUDE C., III, 1600 Memorial Professional Building, Houston, Texas 77002, 1964, '65, '67, '69, '71, '73.
1971. COHEN, SEYMOUR R., 6221 Wilshire Blvd., Los Angeles, Calif. 90048, 1971, '72*, '73*, '74.
1957. CONLEY, JOHN J., 211 Central Park West, New York, N. Y. 10024, 1958*, '60*, '61, '62*, '63*, '64, '65, '70, '72, '74*.
1957. CONVERSE, JOHN MARQUIS, 722 Park Avenue, New York, N. Y. 10021, 1960, '62*, '67.
1959. CRACOVANER, ARTHUR J., 103 E. 78th St., New York, N. Y. 10021, 1959, '60, '61*, '62, '63, '65, '66, '67, '68, '69, '72, '74.
1960. DALY, JOHN F., Faculty Practice Offices, 566 First Ave., New York, N. Y. 10016, 1960, '61*, '62, '63, '64, '65, '66, '67, '68, '69, '70, '71, '72, '73, '74.
1951. DAVISON, FRANCIS W., Geisinger Medical Center, Danville, Pa. 17812, 1951, '52, '53*, '54, '55, '56, '57, '58, '59, '60, '61, '62, '63*, '64, '65, '66, '67*, '68, '69*, '70, '71, '72, '73*, '74.
1973. DEDO, HERBERT H., University of California, S.F. School of Medicine, Rm. 495U, San Francisco, Calif. 94122, 1973*, '74.
1966. DEVINE, KENNETH D., Mayo Clinic, Rochester, Minn. 55901, 1966, '67, '68, '72*, '74*.
1968. DEWEESE, DAVID D., 3181 S.W. Sam Jackson Park Rd., Portland, Ore. 97202, 1968, '69*, '73, '74.
1969. DICKINSON, JOHN T., 1501 Locust St., Pittsburgh, Pa. 15219, 1970, '71, '72, '73.
1973. DUVALL, ARNDT J., III, University of Minn. Hospital, A-605 Mayo Memorial Bldg., Minneapolis, Minn. 55455, 1973*.
1968. FARRIOR, RICHARD T., 509 Bay St., Tampa, Fla. 33606, 1968, '69, '70*, '72, '74.

1964. FEARON, BLAIR, 308 Medical Arts Building, Toronto 5, Ontario, Canada, 1964, '66, '67, '68, '69, '70, '71*, '72*, '73*, '74*.
1963. FERGUSON, CHARLES F., P. O. Box 313, Osterville, Mass. 02655, 1963, '64*, '66, '67*, '68, '69*, '70, '71, '72, '73, '74*.
1955. FITZ-HUGH, GLASSELL SLAUGHTER, P. O. Box 3698 University Station, Charlottesville, Virginia 22903, 1955, '57, '59, '60, '61, '62*, '64, '65, '66, '67*, '68, '69, '70, '71, '72, '73, '74.
1970. FRAZER, JOHN P., 260 Crittenden Blvd., Rochester, N. Y. 14620, 1971, '72, '73, '74.
1956. FRIEDBERG, STANTON A., 1725 West Harrison St., Chicago, Ill. 60612, 1956, '57*, '58, '59, '60, '61, '62, '63, '64, '65*, '67, '68, '69, '70, '71*, '72, '73, '74.
1959. GOLDMAN, JOSEPH L., 1050 Park Ave., New York, N. Y. 10028, 1959, '60*, '61, '62, '63, '64, '65, '66, '67, '68, '69, '70, '71, '72*, '73, '74.
1965. HANCKEL, RICHARD W., JR., 80 Barre St., Charleston, S. C. 29401, 1965, '66, '67, '69, '70, '71, '72, '73, '74.
1957. HARRILL, JAMES A., Bowman Gray School of Medicine, Winston-Salem, N. C. 27103, 1957, '58, '59, '61, '62, '63, '64, '66, '67, '68, '69, '71, '73.
1960. HARRIS, HERBERT H., 907 Hermann Professional Building, Houston, Texas 77025, 1960, '61*, '62, '63, '64, '65*, '66, '67, '68, '69, '70, '71, '72, '73, '74.
1959. HENRY, G. ARNOLD, 170 St. George St., Toronto, Canada, 1959, '61, '63, '66, '67, '69, '70, '73.
1943. HILDING, ANDERSON C., Research Laboratory, St. Luke's Hospital, Duluth, Minnesota 55805, 1944*, '46, '47, '48*, '49, '50, '51, '53, '55, '56*, '57, '60, '61, '62*, '63, '64*, '65, '66, '67, '68, '69, '70, '71, '72, '73, '74.
1955. HILGER, JEROME A., Suite 6A, 393 Dunlap St., St. Paul, Minnesota 55104, 1955, '56*, '57, '58, '59, '60, '62, '63, '64, '65, '66, '68, '69, '70, '71.
1945. HOLINGER, PAUL H., 700 North Michigan Ave., Chicago, Illinois 60611, 1946, '47, '49, '50*, '51*, '52, '53, '54*, '55, '56, '57, '58*, '59, '60, '61*, '62*, '63, '64, '65, '66*, '68, '69*, '72*, '73*, '74.
1957. HOLMES, EDGAR M., 2000 Washington St., Newton, Mass. 02162, 1957, '59, '61, '63, '68, '70, '71, '72, '74.

1974. HUDSON, WILLIAM R., Duke Univ. Med. Center, E.N.T., P.O.P., 3805, Durham, N. C. 27710, 1974.
1961. JONES, EDLEY H., 1301 Washington St., Vicksburg, Miss. 39180, 1961, '62, '63*, '65, '66, '67, '68, '69, '70, '71, '72, '73, '74.
1965. KING, JAMES T., Suite 206, W. Paces Ferry, Professional Building, 3250 Howell Mill Rd. N. W., Atlanta, Ga. 30327, 1965, '66, '67, '69, '70, '71, '73, '74.
1963. KIRCHNER, JOHN A., 333 Cedar St., New Haven, Conn. 06510, 1963, '65*, '67*, '68, '69*, '70, '71*, '72*, '73, '74.
1963. LATHROP, FRANK D., R.F.D. No. 1, Pittsford, Vt. 05763, 1963, '64*, '67*, '69, '70, '71, '72, '73, '74.
1966. LEWIS, JOHN S., 3 East 71st Street, New York, N. Y. 10021, 1966, '67, '68, '69*, '70, '71, '72, '74.
1961. LEWY, ROBERT B., 25 East Washington St., Chicago, Ill. 60602, 1961, '62*, '63, '65*, '67, '68, '69, '70, '71, '73, '74.
1972. LILLIE, JOHN C., Mayo Clinic, Rochester, Minn. 55901, 1972.
1973. LORE, JOHN M., JR., 100 High St., Buffalo, N. Y. 14203, 1974*.
1966. McCABE, BRIAN F., Dept. of Otolaryngology, University Hospitals, Iowa City, Iowa 52240, 1966, '69, '72*, '73.
1963. MCGOVERN, FRANCIS H., 139 South Main St., Danville, Virginia 24541, 1963, '64, '66, '68, '71, '72, '74.
1952. MILLER, ALDEN H., 1407 N. Vermont Ave., Los Angeles, Calif. 90027, 1952, '53*, '55, '57, '58*, '61, '62, '64, '66, '67*, '68, '69, '70, '71, '72, '73*, '74*.
1965. MILLER, DANIEL, 110 Francis St., Boston, Mass. 02215, 1965, '66, '67, '68, '69*, '70, '71, '72, '73*, '74.
1964. MONTGOMERY, WILLIAM W., 243 Charles St., Boston, Mass. 02114, 1964, '65*, '66*, '68*, '70, '71, '72, '74*.
1972. MORSE, HARRY R., Tatakett Square, Teaticket, Mass. 02536, 1972.
1957. MUNOZ-MACCORMICK, CARLOS EDUARDO, 71 Park Terrace, Santurce, Puerto Rico, 1957, '58, '59, '60, '61, '62, '63, '64, '65, '66, '67, '68, '69, '70, '71, '72, '73, '74.

1956. NORRIS, CHARLES MORGAN, 3401 North Broad Street, Philadelphia, Pennsylvania 19140, 1956, '57, '58*, '59, '60, '61*, '62, '63, '64, '66, '67, '68*, '69, '70*, '71, '72, '73, '74.
1961. OGURA, JOSEPH H., 640 So. Kingshighway, St. Louis, Mo. 63110 1961*, '62*, '63, '64*, '65, '66*, '67, '68*, '69, '70, '71*, '72, '73*, '74*.
1958. O'KEEFE, JOHN J., 255 S. 17th St., Philadelphia, Pa. 19103, 1958, '59*, '60, '62, '64, '67, '71, '73, '74.
1961. O'NEIL, JAMES J., 616 Medical Arts Building, Omaha, Nebraska 68102, 1961, '62*, '64, '67, '69, '70, '71, '73.
1961. PANG, LUP Q., 1374 Nuuanu Ave., Honolulu, Hawaii 96817, 1961, '62*, '64, '66, '67, '70, '71, '72, '73.
1961. PASTORE, PETER N., 5503 Riverside Drive, Richmond, Va. 23225, 1961, '62*, '64, '66, '67, '69, '71, '72, '73, '74.
1972. PENNINGTON, CLAUDE L., JR., 800 First St., Macon, Ga. 31201, 1972, '73.
1967. PRATT, LORING W., 325-B Kennedy Memorial Drive, Waterville, Maine 04901, 1967, '68, '69, '70, '71, '72, '73, '74.
1951. PRIEST, ROBERT E., 79 S. Ninth St., Minneapolis, Minn. 55402, 1951, '53*, '54*, '56, '59, '60*, '61, '65, '67*, '68, '69, '70, '71, '72, '73.
1951. PUTNEY, F. JOHNSON, 80 Barre St., Charleston, S. C. 29401, 1951, '52, '53*, '54, '55, '56, '58*, '59, '60, '61, '62, '63*, '64*, '65, '66, '67, '68*, '69*, '70*, '71, '72*, '74.
1963. REED, GEORGE F., 750 E. Adams St., Syracuse, N. Y. 13210, 1963, '65*, '66, '68, '69*, '70, '71, '72, '73.
1974. RITTER, FRANK N., 326 N. Ingalls, Ann Arbor, Mich. 48104, 1974.
1959. SANDERS, SAM H., 1286 Peabody Ave., Memphis, Tenn. 38104, 1959, '60, '61, '62, '63, '65, '70, '71, '72, '73.
1964. SAUNDERS, WILLIAM H., 2545 Otolaryngology, University Hospital, Columbus, Ohio 43210, 1964, '65, '66, '68*, '69, '70*, '71, '72*, '73, '74.
1959. SILCOX, LOUIS E., 108-111 Lankenau Med. Bldg., Philadelphia, Pa. 19151, 1959, '60, '61, '62, '63, '64, '65, '66, '67, '68, '69, '70, '71, '72, '73, '74.

1958. SIMONTON, KINSEY M., Atlanta Ear, Nose and Throat Clinic, 960 Johnson Ferry Rd. N.E., Atlanta, Ga. 30342, 1958, '59*, '62, '64, '66, '67, '69, '72, '74.
1962. SISSON, GEORGE A., Northwestern U. Medical School, 303 Chicago Ave., Chicago, Ill. 60611, 1962, '63*, '65, '66, '68, '69, '70, '71, '72, '73.
1964. SKOLNIK EMANUEL M., Abraham Lincoln School of Medicine, P. O. Box 6998, Chicago, Ill. 60680, 1964*, '65, '66*, '67, '68, '69, '70*, '71, '72, '73.
1974. SNOW, JAMES B., JR., 3400 Spruce St., Philadelphia, Pa. 19104, 1974.
1972. SOBOROFF, BURTON J., 307 N. Michigan Ave., Chicago, Ill. 60601, 1972, '73, '74.
1973. SOM, MAX L., 121 East 60 Street, New York, N. Y. 10022, 1973, '74*.
1954. SOOY, FRANCIS A., University of California Hospital, 3rd and Parnassus Ave., San Francisco, Calif. 94122, 1954, '56*, '58, '60, '62, '63, '64, '65*, '67, '68*, '71.
1961. SUEHS, OLIVER W., 14 Medical Arts Square, Austin, Texas 78705, 1961, '62*, '63, '64, '66, '68, '69, '70, '71, '72, '74.
1963. TABB, HAROLD G., 1430 Tulane Ave., New Orleans, La. 70112, 1963, '65, '66, '67, '69, '71, '72, '74.
1954. THORNELL, WILLIAM C., 2340 Auburn Avenue, Cincinnati, Ohio 45219, 1955*, '57, '59, '60, '63, '68, '70, '72, '74.
1967. TRIBLE, WILLIAM MACL., 1234 19th St., N.W., Washington, D.C. 20036, 1967, '68, '69*, '70, '71, '72, '73, '74.
1970. TUCKER, GABRIEL F., JR., 3401 North Broad St., Philadelphia, Pa. 19140, 1970*, '71, '72, '73*, '74*.
1973. TUCKER, JOHN A., Hahnemann Hospital, 230 N. Broad St., Philadelphia, Pa. 19102, 1973*, '74*.
1974. WARD, PAUL H., UCLA School of Medicine, Los Angeles, Calif. 90024, 1974*.
1962. WEAVER, DELMAR F., Med. Profess. Bldg., Culpeper, Va. 22701, 1962, '63, '64*, '65, '67*, '69, '70, '72, '74.

1940. WEILLE, FRANCIS L., 250 Edgewater Drive, Needham, Massachusetts 02192, 1940, '41, '42, '44, '46*, '47, '48, '49, '50, '51, '52, '53, '54, '55, '56*, '57, '58, '59, '60, '61, '62, '63, '64, '65*, '66, '67, '68, '69, '70, '71, '72, '73.
1971. WILLIAMS, RUSSELL I., 1605 East 19th St., Cheyenne, Wyo. 82001, 1971, '72*, '73, '74.
1951. WOODMAN, DEGRAAF, P.O. Box 560, Easton, Md. 21601, 1951, '53, '54, '55*, '56, '58, '59, '60, '61, '62, '63, '64, '65, '66, '67, '68, '69, '70, '71, '72, '73, '74.
1953. WORK, WALTER P., University Hospitals, 1405 E. Ann St., Ann Arbor, Michigan 48104, 1953, '54, '56, '58, '59*, '62, '63*, '65, '67, '68, '69, '72, '73.

Honorary Fellows

- 1968. (1946) ALONSO, REGULES JUSTO E., Mercedes 1233, Montivideo, Uruguay.
- 1957. (1925) CLERF, LOUIS H., 5575 Eighth Avenue, North, St. Petersburg, Florida 33710, 1957, '58, '59, '60, '61, '63, '64, '65, '66, '68, '69, '70, '71, '72*, '73, '74.
- 1968. (1936) GALLOWAY, THOMAS C., 636 Church St., Evanston, Ill. 60201, 1969, '71.
- 1968. (1957) HUIZINGA, EELCO, Noorderhaven 7, Groningen, The Netherlands, 1957.
- 1967. (1933) LIERLE, DEAN M., University Hospitals, Iowa City, Iowa 52240, 1967, '68, '71, '74.
- 1957. (1930) †NEGUS, SIR VICTOR E., Flat 4, Nutcombe Height, Portsmouth Road, Hindhead, Surrey England, 1957*.
- 1966. (1957) ONO, JO, 6-13, 6-Chome, Roppongi, Minato-Ku, Tokyo, Japan, 1971.
- 1968. (1937) PORTMANN, PROF. GEORGES, 45 Cours Foch, Bordeaux, France, 1947.
- 1968. (1957) RUEDI, PROF. LUZIUS, Kurhausstrasse 50, Zurich, Switzerland, 1957.
- 1970. (1948) ††WILLIAMS, HENRY L., II, 90 Imperial St., West St. Paul, Minn. 55118, 1971.

† Deceased July 15, 1974.

†† Deceased May 28, 1974.

Corresponding Fellows

1972. ARSLAN, PROF. MICHELE, Otorinolaringoiatrica dell' Universita de Padova, 37 Via Altinate, Padova, Italy, 1972.
1959. BARRETTO, PLINIO DE MATTOS, Rua Cons Torres, Homem 371, Sao Paulo, Brazil, 1960, '69, '73.
1959. BATEMAN, SIR GEOFFREY H., Beech Hill, E. Lavington, Petworth, Sussex, England.
1942. BATSON, OSCAR V., 3926 Pine St., Philadelphia, Pennsylvania 19104, 1942*, '54*.
1964. CLEVES, CARLOS, Apto 202, Carrera 14 No. 44-54, Bogota, Colombia, S. A., 1970.
1966. DOHLMAN, GOSTA, Dept. of Otolaryngology, University of Toronto, Toronto, Ontario, Canada, 1966.
1970. HALLIDAY, SIR GEORGE C., 143 Macquarrie St., Sydney, N.S.W. Australia.
1971. HARRISON, D. F. N., 330/332 Gray's Inn Road, London, W.C.1, England, 1971.
1970. HUTCHEON, JACK, Morris Towers, 149 Wickham Terrace, Brisbane, Australia, 1971.
1971. MACBETH, RONALD G., Radcliffe Infirmary, Oxford, England, 1971.
1968. NAKAMURA, FUMIO, Kyoto Prefectural U. Medicine, Kawara-Mach 1, Kamikyo-Ku, Kyoto, Japan.
1964. PEREZ, ALFREDO C., Instituto Celis Perez, Avenida Montes Deoca, Valencia, Venezuela, S. A., 1965.
1971. RETHI, AUREL, Liszt Ster 10, Budapest 6, Hungary.
1952. TAPIA ACUNA, RICARDO, Av. Insurgentes, Sur No. 300, Mexico 7 D.F., 1953, '57, '60*, '67, '73.
1936. VIALLE, JACQUES, 27 Rue de France, Nice (Alpes Maritimes), France.

Emeritus Fellows

1973. (1944) BOIES, LAWRENCE R., Department of Otolaryngology, A-605, Mayo Memorial Bldg., Minneapolis, Minnesota 55455, 1944, '46, '47, '48*, '49, '50*, '51*, '53, '54, '55, '56, '57, '58, '59, '60, '61, '62, '63, '64, '65, '66, '67, '68*, '69, '71.

1966. (1945) CAMPBELL, PAUL A., 700 E. Hildebrand, Apt. 401, San Antonio, Texas 78212.
1965. (1942) CANFIELD, NORTON, Harwood Hospital, Christiansted, St. Croix, Virgin Is.
1969. (1959) CARDWELL, EDGAR P., P.O. Box 581, Shell Island, Wrightsville Beach, N. C. 28480.
1969. (1947) EAGLE, WATT W., Route 6, P. O. Box 339, New Bern, N. C. 28560.
1972. (1962) ERICH, JOHN B., Mayo Clinic, 102 Second Ave., Rochester, Minn. 55901.
1970. (1940) GOODALE, ROBERT L., 141 Argilla Rd., Ipswich, Mass. 01938, 1971, '74.
1963. (1928) GOODYEAR, HENRY M., 2012 Edgecliff Point, Cincinnati, Ohio 45206.
1960. (1940) HANSEL, FRENCH K., 6828 Oakland Av., St. Louis, Missouri 63139, 1962, '65, '73.
1968. (1942) HEATLEY, CLYDE A., 125 Douglas Rd., Rochester, N. Y. 14610, 1942, '46*, '49, '50, '52, '53*, '54, '55, '57, '58, '60, '61, '65.
- ✱ 1961. (1950) KLINE, ORAM R., 896 Lake Ave., Woodbury Heights, N. J. 08097, 1961, '63, '70, '72, '74.
- 1970. (1936) LEJEUNE, FRANCIS E., Ochsner Clinic Bldg., 1514 Jefferson Highway, New Orleans, La. 70121, 1971, '73, '74.
1967. (1949) LINDSAY, JOHN R., 950 E. 59th St., Chicago, Ill. 60621, 1967.
- 1954. (1927) LUKENS, ROBERT M., 141 West Heather Road, Wildwood Crest, N. J. 08260.
1964. (1952) MCCALL, JULIUS W., 22880 Canterbury Lane, Shaker Heights, Ohio 44122, 1964, '66, '68, '69, '70, '71, '72, '73.
1974. (1951) MCHENRY, LAWRENCE C., 301 N.W. 12th St., Oklahoma City, Okla. 73103, 1953*, '62, '63, '64, '65, '66, '68, '71. Montreal, Quebec, Canada, 1972, '73, '74.
1970. (1931) McNALLY, WILLIAM J., 1509 Sherbrooke St. West, Montreal, Quebec, Canada, 1972, '73, '74.

1971. (1954) MOORE, PAUL M., 22520 Calverton Rd., Cleveland, Ohio 44122, 1954, '55*, '56, '57, '59, '60, '61, '62, '63, '64, '65, '66, '68, '70, '71, '74.
1971. (1953) MURTAGH, JOHN A., 2161 N.E. 68th St., Fort Lauderdale, Fla. 33308, 1953, '54, '55, '56*, '57, '58, '59, '61, '62, '63, '65, '66, '67, '69, '70, '72, '74.
- 1959. (1927) MYERSON, MERVIN C., 624 Mourning Dove Drive, Sarasota, Fla. 33577.
1957. (1948) Phelps, Kenneth A., 1788 Oak Creek Drive, Apt. 402, Palo Alto, Cal. 94304, 1971.
- 1969. (1951) RAWLINS, AUBREY G., 384 Post St., San Francisco, Calif. 94108, 1971.
1972. (1956) RICHARDSON, JOHN R., P.O. Box 52, Searsport, Maine 04974.
- 1958. (1938) SALINGER, SAMUEL, 1260 East Alejo Road, Palm Springs, Calif. 92262, 1958, '59, '61, '62, '63, '64, '65, '66, '67, '68, '69, '71.
1962. (1932) SCHALL, LEROY A., 121 Winfield Road, Princeton, N. J. 08540, 1964, '66, '68, '69, '72, '73, '74.
- 1964. (1934) SCHENCK, HARRY P., 1235 Wyngate Rd., Wynnewood, Pa. 19096, 1964, '65*, '66, '68, '69, '70.
- 1965. (1939) SIMPSON, W. LIKELY, 606 E. 5th St., Des Moines, Iowa 50309, 1973.
1969. (1950) SMITH, AUSTIN T., 382 Lakeside Rd., Box 28, Wynnewood, Pa. 19096, 1970, '71, '72, '73, '74.
- 1966. (1947) THEOBALD, WALTER H., 307 No. Michigan Ave., Chicago, Ill. 60601, 1966, '68, '69.
1973. (1963) TOLAN, JOHN F., 1118 Ninth Ave., Seattle, Washington 98101, 1963, '64, '65, '66, '67, '69, '71, '73.
- 1968. (1950) TREMBLE, G. EDWARD, 1374 Sherbrooke St. W., Montreal, Quebec, Canada, 1950, '51, '52, '53, '54, '55*, '56, '57, '58, '60, '61, '62, '63, '65, '66, '67*, '68, '69, '70, '71, '73, '74.
- 1965. (1943) †VAN ALYEA, OLIVER E., 135 South LaSalle St., Chicago, Ill. 60603, 1965, '66, '68, '69, '70, '71, '73.
1961. (1941) VIOLE, PIERRE P., 241 South Windsor, Los Angeles, Calif. 90004, 1964.

† Deceased May 10, 1974.

OFFICERS 1974-1975

* * * *

PRESIDENT

JOSEPH H. OGURA, M.D.**
(†DANIEL C. BAKER, JR., M.D.)

FIRST VICE-PRESIDENT

JOHN A. KIRCHNER, M.D.**

SECOND VICE-PRESIDENT

DOUGLAS P. BRYCE, M.D.

SECRETARY

JOHN F. DALY, M.D.

TREASURER

CHARLES M. NORRIS, M.D.

LIBRARIAN, HISTORIAN AND EDITOR

CHARLES F. FERGUSON, M.D.

* * * *

COUNCIL

The above Ex-officio and

FIRST COUNCILOR

DeGRAAF WOODMAN, M.D.

SECOND COUNCILOR

F. JOHNSON PUTNEY, M.D.

THIRD COUNCILOR

FRANK D. LATHROP, M.D.

FOURTH COUNCILOR

G. SLAUGHTER FITZ-HUGH, M.D.

† Deceased June 2, 1974

** Elected by Council June 6, 1974

INDEX

to the

TRANSACTIONS

of the

AMERICAN
LARYNGOLOGICAL ASSOCIATION

Volumes 85-95

1964 - 1974

Volumes 85-95 Inclusive

1964-1974

AUTHORS INDEX

A

Abramson, Arthur S. 1971, 69
 Acquarelli, Mario J. 1967, 158
 Adams, F. 1967, 24
 Alonso, William A. 1973, 27
 Andrews, Albert H., Jr. 1970, 32; 1974, 75
 Arnold, Godfrey E. 1964, 91
 Arslan, Prof. Michele. 1972, 122
 Atkins, Joseph P. 1966, 102; 1971, 15
 Ausband, John R. 1972, 172

B

Bagley, Carter S. 1970, 89
 Baker, Daniel C., Jr. 1969, 60; 1971, 22;
 1972, 54
 Banovetz, John. 1967, 83
 Batsakis, John G. 1973, 78
 Baxter, James D. 1965, 86
 Biller, Hugh F. 1970, 68; 1971, 35
 Birken, Eric. 1972, 148
 Boies, Lawrence R. 1968, 11; 1971, 121
 Boles, Roger. 1973, 78
 Bone, Robert C. 1970, 68
 Book, Howard. 1970, 44
 Bordley, John E. 1966, 127; 1973, 91
 Bosley, William R. 1973, 91
 Boyle, William F. 1971, 87
 Brewer, David W. 1974, 19
 Briant, T. D. R. 1968, 130; 1970, 44; 1971,
 44
 Brown, Lester A. 1965, 183
 Brown, William T. 1967, 35
 Broyles, Edwin N. 1971, 14
 Brunschwig, J. Pierre. 1973, 40
 Bryan, Marian P. 1964, 145
 Bryan, William T.K. 1964, 145
 Bryce, Douglas P. 1966, 161; 1967, 91; 1968,
 130; 1971, 44
 Butel, Janet S. 1973, 40

C

Calcaterra, Thomas C. 1972, 162; 1973, 86
 Camp, Herbert L. 1969, 49
 Cardelli, David D. 1970, 32
 Chandler, J. Ryan. 1969, 68
 Chapman, Clifford E. 1972, 11
 Cherney, Edward F. 1973, 86
 Cherry, Jerry. 1966, 127; 1970, 80
 Clerf, Louis H. 1972, 23

Cohen, Seymour R. 1970, 36; 1972, 39;
 1973, 107

Cohn, Arnold M. 1973, 40
 Coleman, R. 1970, 80
 Comito, John N. 1966, 78
 Conley, John J. 1974, 49
 Cook, Ted A. 1973, 40
 Cooper, Franklin S. 1971, 69
 Cotton, Robin. 1972, 57; 1974, 31
 Cowan, Malcolm. 1973, 27
 Curran, Timothy. 1966, 189

D

Daly, John F. 1968, 236; 1972, 174
 Dammkoehler, Richard. 1964, 39
 Davis, W. 1970, 80
 Davison, Francis W. 1967, 45; 1969, 35;
 1973, 100
 Dedo, Herbert H. 1968, 107, 1971, 54; 1973,
 53
 deFries, Hugh O. 1974, 85
 Derbyshire, Arthur J. 1970, 32
 Desilets, D. T. 1967, 214
 Devine, Kenneth D. 1972, 142; 1974, 102
 DeWeese, David D. 1969, 38
 Dickey, J. R. 1965, 168
 Dodd, Gerald D. 1972, 65
 Druck, Norman. 1973, 27
 Dunbar, J. Scott. 1967, 68
 Duvall, Arndt J., III. 1973, 21

E

Eagle, Watt W. 1965, 133
 Ellis, David. 1971, 60
 Erich, John B. 1966, 178; 1970, 128

F

Farrior, Richard T. 1970, 52
 Fearon, Blair. 1971, 60; 1972, 57; 1973, 107;
 1974, 31
 Ferguson, Charles F. 1964, 127; 1967, 55;
 1969, 11; 1974, 35
 FitzHugh, G. Slaughter. 1967, 114; 1974, 11
 Fitzpatrick, P. J. 1970, 44
 Flake, Carlyle G. 1964, 127
 Fogarty, William A. 1971, 87
 Frazer, John P. 1966, 155
 Friedberg, Stanton A. 1965, 53; 1971, 76

Fukuda, H. 1972, 136
 Funkhouser, George E. 1969, 39
 Furstenberg, Albert C. 1965, 11

G

Galloway, Thomas C. 1965, 180
 Garland, L. Henry. 1964, 160
 Goepfert, Helmuth. 1973, 40
 Goldman, Joseph L. 1966, 55; 1972, 148
 Goldman, Ronald. 1969, 40
 Goodale, Robert L. 1965, 109; 1974, 17
 Griffith, Thomas E. 1965, 53

H

Hadfield, E. H. 1971, 93
 Harris, Herbert H. 1965, 168
 Harris, Perry F. 1966, 114
 Harrison, D. F. N. 1972, 132
 Harvey, Joseph E. 1970, 68
 Hass, George M. 1965, 53; 1971, 76; 1972, 27
 Hast, Malcolm H. 1972, 27
 Hayes, Thomas P. 1971, 15
 Hecht, Dwight. 1968, 151
 Hermans, Paul E. 1968, 25
 Hilding, Anderson C. 1964, 11; 1966, 22
 Hilding, David A. 1966, 22
 Hill, Frederick T. 1966, 184; 1969, 149
 Holinger, Paul H. 1966, 11; 1967, 35; 1969, 82; 1972, 46; 1973, 107
 Holt, Gordon P. 1972, 111
 Hoople, Gordon D. 1970, 134; 1971, 118
 Hoover, Walter B. 1973, 14
 Huff, John S. 1967, 83

J

Jaffe, Burton F. 1973, 15
 Jerome, D. L. 1966, 78
 Jing, B. S. 1972, 65
 Johner, Carl H. 1970, 77
 Johns, Michael E. 1973, 78

K

Kaneko, Toshio. 1970, 94
 Kawamoto, S. 1973, 61
 Kawasaki, Masashi. 1964, 39; 1966, 37
 Keim, W. Franklin. 1968, 204
 Kersta, L. G. 1967, 106
 Kirchner, John A. 1965, 16; 1967, 71; 1969, 119; 1971, 27; 1972, 136
 Kitamura, Takeshi. 1970, 94
 Kluyskens, Paul. 1970, 93
 Knight, John S. 1966, 148; 1967, 178
 Koeck, George. 1968, 204
 Komorn, Robert M. 1974, 55
 Krause, Charles J. 1972, 157
 Kuo, Burns F. 1970, 110

L

Lathrop, Frank D. 1964, 206; 1968, 188; 1973, 11
 Latourette, Howard B. 1968, 211
 Lavelle, William G. 1974, 62
 Lawson, Lucie I. 1973, 53
 Lederer, Francis L. 1966, 15; 1968, 96
 LeJeune, Francis E. 1970, 22
 Leonard, James R. 1968, 211; 1972, 111
 Levin, Ralph J. 1970, 101
 Lewis, John S. 1969, 101
 Lewey, Robert B. 1965, 160
 Lierle, Dean M. 1968, 19; 1974, 18
 Lisker, Leigh. 1971, 69
 Litton, Ward B. 1968, 211
 Lord, Ian J. 1971, 44
 Lore, John M., Jr. 1974, 90

M

Macbeth, Ronald G. 1971, 52 & 93
 Maran, Arnold G. 1972, 111
 McCabe, Brian F. 1968, 211; 1972, 157
 McCall, Gerald. 1974, 19
 McCall, Julius W. 1966, 175
 McClure, Joseph A. 1971, 44
 McCoy, E. Gordon. 1971, 87
 McNally, William J. 1967, 20
 McStravog, Lawrence J. 1969, 92
 Meyerhoff, Wm. L. 1973, 21
 Miles, William K. 1971, 98 & 104
 Miller, Alden H. 1967, 141; 1970, 11; 1973, 107; 1974, 71
 Miller, Daniel. 1969, 140; 1973, 47
 Miller, Lee H. 1970, 72
 Montgomery, William W. 1965, 94; 1966, 136; 1968, 114; 1974, 62
 Moore, G. Paul. 1969, 40; 1971, 74
 Moran, John J. 1964, 26
 Moss, Harold W. 1974, 75

N

Nahum, Alan. 1967, 78
 Nash, C. Stewart. 1967, 162
 Neel, H. Bryan. 1972, 142; 1974, 102
 Nelson, J. Roger. 1964, 39; 1968, 53; 1973, 61
 Newlands, W. A. 1966, 181
 Nichols, Richard D. 1972, 94
 Norris, Charles M. 1968, 159; 1970, 110

O

Ogura, Joseph H. 1964, 39; 1966, 37; 1968, 53; 1970, 68; 1971, 35; 1973, 61; 1974, 43
 Olson, Nels R. 1971, 98 & 104
 O'Rahilly, Ronan. 1972, 35

P

- Peale, Augustin. 1968, 159
 Pearson, F. G. 1968, 130
 Pennington, Claude L. 1972, 100
 Pierce, Max K. 1973, 109
 Pitser, William F. 1970, 110
 Ponzoli, Virgil A. 1969, 68
 Pressman, Joel J. 1967, 11
 Priest, Robert E. 1967, 83
 Proetz, Arthur W. 1964, 20
 Putney, F. Johnson. 1964, 26; 1966, 174;
 1967, 70; 1968, 84 & 232; 1969, 92; 1970,
 89; 1972, 11

R

- Raventos, Antolin. 1971, 15
 Rawlins, Aubrey C. 1968, 44
 Rawls, William E. 1973, 40
 Reed, George F. 1965, 36; 1969, 49
 Richards, Lyman G. 1967, 174
 Ritter, Frank N. 1964, 65
 Rodriquez, Ambrosio. 1971, 104
 Roffman, Jeffrey D. 1972, 148
 Rontal, Eugene. 1973, 21
 Rosenblatt, A. 1970, 80
 Rulon, J. Thomas. 1964, 177

S

- Saffouri, M. 1973, 86; 1974, 106
 Sanders, Jay. 1969, 40
 Sanders, Sam H. 1972, 73
 Sarkisian, Sarkis. 1968, 204
 Saunders, William H. 1968, 170; 1970, 25;
 1972, 170
 Savetsky, Lawrence. 1972, 54
 Sawashima, M. 1971, 69
 Schenck, Harry P. 1964, 240; 1965, 147
 Schild, Joyce A. 1969, 82; 1972, 46
 Schloss, Charles D. 1968, 170
 Sessions, Donald G. 1974, 43
 Simonton, Kinsey M. 1964, 177
 Skolnik, Emanuel M. 1964, 80; 1966, 78;
 1970, 101
 Sly, Donald. 1967, 114
 Smith, Austin T. 1965, 190
 Smith, Catherine A. 1964, 145
 Smits, Robert G. 1972, 157
 Soboroff, Burton. 1968, 96; 1970, 101
 Som, Max L. 1971, 27; 1974, 95
 Sooy, Francis A. 1965, 69 & 193; 1968, 107
 Stagman, Robert. 1971, 76
 Stephenson, Sam E., Jr., 1966, 114
 Stern, Floyd. 1972, 162
 Strome, Marshall. 1974, 35
 Suemitsu, M. 1973, 61

- Suzuki, M. 1967, 71
 Swain, Ronnie E. 1974, 43
 Szanto, Paul A. 1970, 77

T

- Takenouchi, S. 1966, 37
 Tardy, M. Eugene, Jr. 1970, 101
 Taub, Stanley. 1974, 51
 Tenta, Louis T. 1966, 78; 1970, 101
 Togowa, K. 1970, 94
 Towers, Bernard. 1967, 24
 Townsend, Gary L. 1972, 142
 Tremble, G. Edward. 1967, 148
 Tribble, William M. 1969, 110
 Tucker, Gabriel F., Jr. 1970, 110; 1973,
 27 & 107; 1974, 24
 Tucker, John A. 1972, 35; 1973, 27;
 1974, 24

U

- Unno, Tokuji. 1968, 53; 1970, 94
 Urrea, Robert D. 1973, 53

V

- Van Nostrand, Peter. 1971, 44
 Violé, Pierre P. 1965, 187

W

- Wang, Chun-I. 1972, 39
 Ward, Paul H. 1964, 110; 1966, 114; 1969,
 40; 1972, 162; 1974, 106
 Way, Walter L. 1965, 69
 Weaver, Delmar F. 1964, 223; 1967, 120
 Weiland, L. M. 1974, 102
 Weille, Francis L. 1965, 122
 Weissman, Bruce. 1971, 22
 Wepman, Joseph M. 1964, 110
 Wette, Reimut. 1971, 35
 Whicker, J. H. 1974, 102
 Wied, George L. 1966, 21
 Williams, Henry L. 1969, 19
 Williams, Russell I. 1972, 85
 Woodman, DeGraaf. 1971, 11
 Woodward, Fletcher D. 1964, 243
 Work, Walter P. 1968, 151; 1970, 131
 Wyke, Barry D. 1965, 16

Y

- Yagi, Masokatsu. 1966, 37
 Yarrington, C. T., Jr. 1966, 155
 Young, David J. 1964, 223
 Young, Frank W. 1968, 84

Z

- Zak, Frederick G. 1966, 55; 1972, 148

Volumes 85-95 Inclusive
1964-1974

SUBJECT INDEX

A

- Abscess, (Metastatic), as a Complication of Retrograde Esophageal Dilatation. (Rontal, Meyerhoff & Duval). 1973, 21.
- Acute Treatment of Experimental Laryngeal Fractures. (Miles, Olson and Rodriguez) 1971, 104.
- Addresses:
(Guest of Honor)
Broyles, Edwin N. 1971, 14
Clerf, Louis H. 1972, 23
Goodale, Robert L. 1974, 17
Hoover, Walter B. 1973, 14
Lederer, Francis L. 1966, 15
LeJeune, Francis E. 1970, 22
Lierle, Dean M. 1968, 19
McNally, William J. 1967, 20
Proetz, Arthur W. 1964, 20
Williams, Henry L. 1969, 19
- (Presidential)
Boies, Lawrence R. 1968, 11
Davison, Francis W. 1969, 35
Fitz-Hugh, G. Slaughter. 1974, 11
Furstenberg, Albert C. 1965, 11
Hilding, Anderson C. 1964, 11
Holinger, Paul H. 1966, 11
Lathrop, Frank D. 1973, 11
Miller, Alden H. 1970, 11
Pressman, Joel J. 1967, 11
Putney, F. Johnson. 1972, 11
Woodman, DeGraaf. 1971, 11
- Adenocarcinoma of the Ethmoids in Furniture Workers, (Hadfield and Macbeth). 1971, 93.
- Adenocarcinoma of the Larynx. (Devine and Whicker). 1974, 102.
- Adenomas, (Pleomorphic), of Salivary Glands, - Carcinoma in. (Boles, Batsakis & Johns). 1973, 78.
- Adjustments, Subtle Laryngeal. (Moore). 1971, 74.
- Airway Obstruction (Upper) and Pulmonary Function, - Experimental Observations of Relationships between. (Ogura, Nelson, Dammkoehler & Kawasaki). 1964, 39.
- Airway Problems:
Management of Long-term in Infants and Children. (Fearon & Ellis). 1971, 60.
In Severely Burned Patients. (Reed and Camp). 1969, 49.
In Newborns, - Treatment of (Ferguson). 1967, 55.
- Allergic Laryngitis. (Williams, Russell I.). 1972, 85.
- American Board of Otolaryngology - Fifty Years. (Lierle). 1974, 18.
- Analysis of Serial Sections in Preoperative Radiation of Larynx. (Skolnik, Soboroff, Tardy, Levin & Tenta). 1970, 101.
- Anastomosis, Recurrent Laryngeal Nerve in Dogs, - EMG and Visual Evaluation. (Dedo) 1971, 54.
- Anastomosis and Surgical Resection of Tracheal Stenosis. (Ward, and Saffouri). 1974, 106.
- Anatomy, (Cutaneous, Vascular), of Pectoral Skin Flaps. (Calcaterra, Cherney and Saffouri). 1973, 86.
- Anesthesia (Local), - Exploration of Mediastinum under. (Ward, Stephenson and Harris, P.) 1966, 114.
- Angiofibroma (Nasopharyngeal, Juvenile), - Radiological Treatment of. (Briant, Fitzpatrick and Book). 1970, 44.
- Anomalies of Larynx (Congenital). (Holinger & Brown, W.T.). 1967, 35.
- Anterior Commissure Revisited. (Tucker, G.F., Tucker, J.A., Alonso, Cowan and Druck). 1973, 27.
- Application of Voice-print Techniques to Vocal Analysis. (Kersta). 1967, 106.
- Appreciation of Lyman Guilder Richards, M.D. (Ferguson). 1969, 11.
- Approach to the Internal Laryngocele and Other Submucosal Lesions of the Larynx. (Yarrington and Frazer). 1966, 155.
- Aspects of Fetal Laryngeal Development. (Tucker, J.A.) 1974, 24.
- Arterial Blood Gas Tension Changes and Pulmonary Resistance in Nasal and Partial Laryngeal Obstruction. (Ogura, Sue-mitsu, Nelson and Kawamoto). 1973, 61.
- Arteries (Carotid), Retropharyngeal Hemorrhage from. (Weaver and Young, D.J.). 1964, 223.
- Arthrodesis, Crico-arytenoid. (Montgomery). 1966, 136.
- Articular Reflex Mechanisms in the Larynx. (Kirchner and Wyke). 1965, 16.
- Asai Technique (Two-Stage) of Laryngectomy. (Putney and Bagley). 1970, 89.
- Asai Technique for Vocal Rehabilitation after Total Laryngectomy. (Miller, A.). 1967, 141.
- Atresia, Choanal (Congenital), in Infants and Children. (Ferguson and Flake). 1964, 127.
- Atresia, Choanal, - Surgical Correction of. (Cherry and Bordley). 1966, 127.
- Autograft (Laryngo-tracheal) for Post-cricoid Carcinoma. (Som). 1974, 95.

B

- Baseline Values in Pulmonary Mechanics for Physiologic Surgery of the Nose.

- (Ogura, Unno and Nelson). 1968, 53.
- Bilateral Vocal Cord Paralysis of Undetermined Etiology: Clinical Course and Outcome). (Neel, Townsend and Devine). 1972, 142.
- Bio-dynamics of Injury to the Larynx and Adjacent Structures in Automobile Collisions. (Nahum). 1967, 78.
- Biopsies (Central and Peripheral) in Combined Therapy of Head and Neck Cancers. (Keim). 1968, 204.
- Blockage (Total, Nasal) by Polyps of Allergic and Infectious Origin. (Sanders, S.H.) 1972, 73.
- Blood Gas Tension Changes (Arterial) and Pulmonary Resistance in Nasal and Laryngeal Obstruction in Dogs. (Ogura, Suemitsu, Nelson and Kawamoto). 1973, 61.
- Burns, Upper Airway Problems in. (Reed and Camp). 1969, 49.
- C
- Cancer:
- Analysis of 311 Cases of Cancer of Larynx Treated Surgically. (Putney and Chapman). 1972, 11.
- Laryngeal and Pharyngeal, - Elective Neck Dissection for. (Ogura, Biller and Wette). 1971, 35.
- Laryngeal, - One Hundred Cases Studied by Serial Sections. (Kirchner). 1969, 119.
- Oral Cavity; Five-Year End Results. (Trible). 1969, 110.
- Pre-operative Radiation in Head and Neck. (Skolnik, Tenta, Comito, and Jerome). 1966, 78.
- Supra-glottic: Clinical and Histological Observations. (Kirchner and Som). 1971, 27.
- Carbon-dioxide Laser in the Larynx. (Andrews). 1974, 75.
- Carcinoma:
- Adenoid (Cystic), - Radiographic Findings in. (Dodd and Jing). 1972, 65.
- Combined Radiation and Surgical Therapy: Tongue, Tonsil and Floor of Mouth. (Improvement in Cure-rates). (Leonard, Litton, Latourette and McCabe). 1968, 211.
- Larynx:
- Analysis of 311 Cases Treated Surgically. (Putney and Chapman). 1972, 11.
- High-dosage Pre-operative Radiation and Surgery. (Goldman, Zak, Roffman and Birken). 1972, 148.
- Histopathology of Larynges and Radical Neck Specimens in a Combined Radiation and Surgery Program. (Goldman et al). 1966, 55.
- Metastatic to the Esophagus. (Atkins). 1966, 102.
- Treatment by Radiotherapy. (Garland) 1964, 160.
- Papilloma (and Carcinoma), - Place of Cryosurgery in? (Miller, D.). 1973, 47.
- In Plemorphic Adenomas of Salivary Glands. (Boles, Johns and Batsakis). 1973, 78.
- Post-cricoid: Laryngo-tracheal Autograft in. (Som). 1974, 95.
- Post-Radiation in Larynx. (Baker and Weissman). 1971, 22.
- Study of Central and Peripheral Biopsies in Combined Therapy of Head and Neck. (Keim). 1968, 204.
- Super-Voltage Radiation Therapy in Larynx. (Lathrop). 1968, 188.
- Trachea. (Acquarelli et al). 1967, 158.
- Vocal Cord, - Treatment of by Vertical Hemilaryngectomy. (Leonard, Holt and Maran). 1972, 111.
- "Untreated," - of the Larynx. (Norris and Peale). 1968, 159.
- Cardiovascular Reflex Pathways from the Larynx and Pharynx. (Kirchner and Suzuki). 1967, 71.
- Carotid Arteries, - Retropharyngeal Hemorrhage from. (Weaver and Young, D. J.). 1964, 223.
- Cartilaginous Tumors of the Larynx. (Putney and Moran), 1964, 26.
- Cells:
- Ciliated (Human, Epithelial) in Nasal Secretions (Morphologic and histochemical aspects). (Bryan, W.T.K., Bryan, M.P. and Smith, C.A.) 1964, 145.
- Mast Cells in Upper Respiratory Tract. (Schenck). 1965, 147.
- Ultra-structure of tracheal cilia during Regeneration. Hilding, A.C. and Hilding, D.A.) 1966, 22.
- Cervical Osteophytes and Dysphagia. (Saunders). 1970, 25.
- Changes in the Respiratory Activity of the Crico-thyroid Muscle with Intra-thoracic Interruption of Vagus Nerve. (Fukuda and Kirchner). 1972, 136.
- Chemodectoma (Glomus) Tumor of Larynx. (Baxter). 1965, 86.
- Children, Unusual Problems (Laryngeal). (Jaffe). 1973, 15.
- Choanal Atresia (Congenital) in Infants and Children. (Ferguson and Flake). 1964, 127.

- Choanal Atresia, - Surgical Correction of. (Cherry and Bordley). **1966**, 127.
- Chronic Laryngeal Stenosis. (Baker). **1969**, 60.
- Cilia (Tracheal), - Ultra-structure of during Regeneration. (Hilding, A.C. and Hilding, D.A.). **1966**, 22.
- Cilia (Respiratory) - Electron Studies of. (Tremble). **1967**, 148.
- Classification (Histologic) of Malignant Lesions of Oral Cavity, Pharynx and Larynx. (Wied). **1966**, 21.
- Clinical Application of Recent Advances in Laryngeal Physiology. (Arnold). **1964**, 91.
- Clinical and Histological Observations on Supra-glottic Cancer. (Kirchner and Som). **1971**, 27.
- Clinico-Histological Study of Chronic Pharyngeal Symptoms. (Rulon and Simon-ton). **1964**, 177.
- Combined External and Endoscopic Hypopharyngeal Diverticulectomy. (Putney and McStravog). **1969**, 92.
- Commissure, Anterior, Revisited. (Tucker, G.F., Tucker, J.A., Alonso, Cowan and Druck). **1973**, 27.
- Complications Associated with Combined Therapy of Oral and Pharyngeal-Neoplasms. (Smits, Krause and McCabe). **1972**, 157.
- Complications (Laryngeal and Tracheal) of Intubation. (Bryce, Briant and Pearson). **1968**, 130.
- Complications (Post-Intubation) Multiple. (Ferguson & Strome). **1974**, 35.
- Complications of Retrograde Esophageal Dilatations, - Metastatic Abscesses as. (Rontal, Meyerhoff and Duvall). **1973**, 21.
- Congenital Anomalies of the Larynx, (Webs, Cysts and Laryngoceles). (Holinger and Brown, W.T.). **1967**, 35.
- Congenital Choanal Atresia in Infants and Children. (Ferguson and Flake) **1964**, 127.
- Correlation of Clinical Staging, Pathological Findings and Five-Year End Results in Surgically Treated Cancer of the Larynx. (Norris, Tucker, G.F., Kuo and Pitser). **1970**, 110.
- Cortico-steroids, - Indications and Dangers in Upper Respiratory Tract Therapy. (Rawlins). **1968**, 44.
- Crico-Arytenoid Arthrodesis. (Montgomery). **1966**, 136.
- CryoSurgery in Head and Neck Tumors. (Miller, D.). **1969**, 140.
- CryoSurgery in Treatment of Papillomata or Carcinoma of Larynx. (Miller, D.). **1973**, 47.
- Cure. Improvement in Cure-rates from Combined Therapy of Oropharyngeal Cancer. (Leonard, Litton, Latorette and McCabe). **1968**, 211.
- Current Status of Radiotherapy in Carcinoma Laryngis. (Garland) **1964**, 160.
- Current Concepts of Central Lymphoid Tissues in Immunology. (Hermans). **1968**, 25.
- Cutaneous Vascular Anatomy of Pectoral Skin Flaps. (Calcaterra, Cherney and Saffouri). **1973**, 86.

D

- Decannulation Problems in Infants. (Baker and Savetsky). **1972**, 54.
- Dermal Graft and Tongue Flap in Reconstruction of Hypopharynx. (Loré), **1974**, 90.
- Development (Early) of the Human Laryngeal Muscles. (Hast). **1972**, 27.
- Development, Laryngeal, Fetal. (Tucker, J.A.). **1974**, 24.
- Diagnosis and Surgical Management of Congenital Tracheo-esophageal Fistula without Atresia of the Esophagus. (Cohen). **1970**, 36.
- Diagnostic Radiology for the Rhino-laryngologist. (Slide presentation) (Funkhouser). **1969**, 39.
- Dilatation (Esophageal, retrograde), - Metastatic Abscesses as a Complication of. (Rontal, Meyerhoff and Duvall). **1973**, 21.
- Dilemma of Delayed Radiation Injury of the Larynx. (Calcaterra, Stern and Ward, P.H.). **1972**, 162.
- Diplophonia, (Ward, P.M., Sanders, J., Goldman R. and Moore). **1969**, 40.
- Diverticulectomy (Hypopharyngeal), - Combined External and Endoscopic. (Putney and McStravog). **1969**, 92.
- Diverticulum, (Pharyngeal). (Macbeth). **1971**, 52.
- Diverticulum, (Zenker's) (Hypopharyngeal). (Holinger and Schild). **1969**, 82.
- Dysphagia and Cervical Osteophytes. (Saunders). **1970**, 25.
- Dysphonia, - Treatment of, by Intra-cordal Injection of Teflon. (Dedo, Urrea and Lawson), **1973**, 53.

E

- Early Development of the Human Laryngeal Muscles. (Hast). **1972**, 27.
- Edema (Laryngeal): Experimental Study.

- (Billar, Bone, Harvey and Ogura). 1970, 68.
- Effect of Hypothyroidism on Larynx of Rat: Explanation of Hoarseness in Humans. (Ritter). 1964, 65.
- Elective Neck Dissection for Pharyngeal and Laryngeal Cancers. (Ogura, Billar and Wette). 1971, 35.
- Electron Microscopic Identification of Virus-like Particles in Laryngeal Papilloma. (Boyle, McCoy and Fogarty). 1971, 87.
- Electron Studies. - Special Reference to Respiratory Cilia. (Tremble). 1967, 148.
- Embryology of the Human Larynx (Tucker, J.A. and O'Rahilly). 1972, 35.
- EMG and Visual Evaluation of Recurrent Laryngeal Nerve Anastomosis in Dogs. (Dedo) 1971, 54.
- Endo-tracheal Intubation. - Histologic Changes Produced by. (Sooy and Way). 1965, 69.
- Epiglottis and Hypopharynx. - Lipoma of, in Same Patient. (Eagle). 1965, 133.
- Esophageal Motility Studies in Globus Sensation. (Calderelli, Andrews and Derbyshire). 1970, 32.
- Esophageal Neoplasms (Post-cricoid and Cervical). - Role of Surgery in. (Harrison). 1972, 132.
- Esophagostomy (Cervical, elective) (Fitz-Hugh and Sly). 1967, 114.
- Esophagus:
- Combined External and Endoscopic Hypopharyngeal Diverticulectomy. (Putney and McStravog). 1969, 92.
 - Elective Cervical Esophagostomy. (Fitz-Hugh and Sly). 1967, 114.
 - Metastatic Carcinoma to. (Atkins). 1966, 102.
 - Metastatic Abscesses as Complications of Retrograde Dilatation. (Rontal, Meyerhoff and Duvall). 1973, 21.
- Ethmoids. - Adenocarcinoma of, in Furniture Workers. (Hadfield and MacBeth). 1971, 93.
- Evaluation of Super-Voltage Radiation Therapy for Carcinoma of Larynx. (Lathrop). 1968, 188.
- Experiences with Carbon-dioxide Laser in Larynx. (Andrews). 1974, 75.
- Experiences with Partial Laryngopharyngectomy. (Skolnik et al.) 1964, 80.
- Extra-parotid Disease Simulating Parotid Masses. (Nichols). 1972, 94.
- Exploration of Mediastinum under Local Anesthesia. (Ward, P.H., Stephenson and Harris, P.F.). 1966, 114.
- External Trauma of the Larynx and Trachea: Immediate Management of. (Pennington). 1972, 100.
- ### F
- Fetal Laryngeal Development. (Tucker, J.A.). 1974, 24.
- Fiber-optic Study. - Visible Laryngeal Changes during Voice Therapy. (Brewer and McCall). 1974, 19.
- Fibroma (Ossifying) of the Sinuses. (Young and Putney). 1968, 84.
- Fibrosarcoma of Head and Neck. (Swain, Sessions and Ogura). 1974, 43.
- First Experiences with the Asai Technique for Vocal Rehabilitation after Total Laryngectomy. (Miller, A.) 1967, 141.
- Fistula (Tracheo-esophageal, without Atresia): Diagnosis and Surgical Management of. (Cohen). 1970, 36.
- Fractures (Laryngeal): Acute Treatment of (Experimental). (Miles, Olson and Rodriques). 1971, 104.
- Frontal Sinus. - Mucocoeles of (Bordley and Bosley). 1973, 91.
- Frontal Sinus, Obliteration of. (Goodale). 1965, 109.
- Frontal Sinus Operation, Osteoplastic Approach: Coronal Incision. (Montgomery). 1965, 94.
- Furniture Workers. - Adenocarcinoma of Ethmoids in. (Hadfield and Macbeth). 1971, 93.
- Further Efforts for Correction of Severe Acute or Chronic Laryngeal Stenosis: Double-post Teflon Tube Utilization. (Knight). 1966, 148.
- ### G
- Glomus Tumor (Chemodectoma) of Larynx (Baxter). 1965, 86.
- Graft (Mucosal Pedicle) for Glottic Stenosis. (Dedo and Sooy). 1968, 107.
- Grafts, Use of Dermal, In Otolaryngology (Reed) 1965, 36.
- GUESTS OF HONOR Remarks. (See under "ADDRESSES")
- ### H
- Head and Neck:
- Fibrosarcoma of. (Swain, Sessions and Ogura) 1974, 43.
 - Cryosurgery in Tumors of. (Miller, D.). 1969, 140.
 - Pre-operative Radiation in Cancer of. (Skolnik, Tenta, Comito and Jerome). 1966, 78.
 - Serial Central and Peripheral Biopsies in Combined Therapy for Cancer of. (Keim). 1968, 204.

- Hemangioma of the Head and Neck in Children, - Steroid Treatment of. (Cohen and Wang). 1972, 39.
- Hemilaryngectomy (Vertical), Treatment of Vocal Cord Carcinoma by. (Leonard, Holt and Maran). 1972, 111.
- Histologic Changes in the Trachea Following Tracheotomy. (Friedberg, Griffiths and Hass). 1965, 53.
- Histologic Changes Produced by Endotracheal Intubation. (Sooy and Way). 1965, 69.
- Histologic Classification of Early Malignant Lesions of the Oral Cavity, Pharynx and Larynx. (Wied) 1966, 21.
- Histopathology of Larynges and Radical Neck Specimens in Radiation and Surgery for Advanced Laryngeal Carcinoma. (Goldman et al). 1966, 55.
- Hoarseness Associated with Hypothyroidism. (Ritter). 1964, 65.
- Homo-transplantation of Dog Larynx. (Ogura, Kawaski, Takenouchi and Yagi). 1966, 37.
- Human Larynx Homo-transplantation. (Kluyskens). 1970, 93.
- Hyperbaric Conditions, - Irradiation Therapy under. (Saunders and Schloss). 1968, 170.
- Hyperbaric Perfusion of the Isolated Larynx. (Briant, van Nostrand, Bryce, Lord and McClure). 1971, 44.
- Hyperplastic Rhino-sinusitis. (Davison). 1973, 100.
- Hypopharynx:
- Lipoma of Epiglottis and Hypopharynx in Same Patient. (Eagle). 1965, 133.
 - Diverticulectomy, Combined External and Endoscopic. (Putney and McStravog). 1969, 92.
 - Reconstruction using Tongue Flap and Dermal Grafts. (Loré). 1974, 90.
 - Zenker's Diverticulum. (Holinger and Schild). 1969, 82.
- Hypothyroidism with Effect on Larynx of Rat: Explanation for Hoarseness in Human. (Ritter). 1964, 65.
- I
- Immunology, - Current Concepts of Central Lymphoid Tissues in. (Hermans) 1968, 25.
- Improvement in Cure-rates from Combination Therapy of Oro-pharyngeal Cancer. (Leonard, Litton, Latourette and McCabe). 1968, 211.
- Implants (Pharyngeal), for Reduction of Air-space in Velo-pharyngeal Insufficiency. (Ward and Wepman). 1964, 110.
- Incision (Coronal) for Osteoplastic Approach to Frontal Sinus. (Montgomery). 1965, 94.
- Incisions (Double transverse) in Major Head and Neck Surgery. (Chandler and Ponzoli). 1969, 68.
- In Defense of Clinical Research. (Davison). 1969, 35.
- Indications and Dangers of Upper Respiratory Tract Corticosteroid Therapy. (Rawlins). 1968, 44.
- Infant, Inflammatory Diseases of Larynx in. (Davison). 1967, 45.
- Infant, Treatment of Airway Problems in. (Ferguson). 1967, 55.
- Infants, Decannulation Problems in. (Baker) 1972, 54.
- Inflammation, Chronic, of Salivary Glands. (Lathrop). 1964, 206.
- Inflammatory Diseases of Larynx of Infants and Small Children. (Davison). 1967, 45.
- Injuries:
- Bio-dynamics of the Larynx and Adjacent Structures in Automobile Collisions. (Nahum). 1967, 78.
 - Laryngeal, Delayed Radiation in. (Calcaterra, Stern and Ward, P.H.). 1972, 162.
 - Laryngeal, Laryngeal, Acute, Blunt, - Treatment of. (Olson & Miles). 1971, 98.
 - Laryngo-tracheal. (Priest, Huff and Banovetz). 1967, 83.
 - Pharyngeal, Laryngeal and Tracheal, in Pediatric Age-Group. (Holinger and Schild). 1972, 46.
 - Repair of Laryngo-tracheal, by "Trough" Method. (Bryce and Lawson). 1965, 91.
- Intra-Thoracic Interruption of Vagus Nerve, - Changes in Respiratory Activity of Cricothyroid Muscle with. (Fukuda and Kirchner). 1972, 136.
- Intubation, - Laryngeal and Tracheal Complications. (Bryce, Briant and Pearson). 1968, 130.
- Intubation (Post-), Multiple Complications. (Ferguson and Strome) 1974, 35.
- Irradiation, (Carcinoma of Larynx) - Diagnosis and Treatment by Surgery or. (Hayes, Atkins, and Raventos). 1971, 15.
- Irradiation Therapy under Hyperbaric Conditions. (Saunders and Schloss). 1968, 170.
- Intracordal Injection of Teflon in Treatment of 135 Patients with Dysphonia. (Dedo, Urrea and Lawson). 1973, 53.

L

- Lanthanic Neck Mass. (Lederer and Soboroff) 1968, 96.
- Laryngeal:
- Carcinoma or Papillomata, - Place of CryoSurgery in Treatment of? (Miller, D.). 1973, 47.
 - Changes during Voice Therapy. (Brewer and McCall). 1974, 19.
 - Development, Fetal. (Tucker, J.A.). 1974, 24.
 - Muscles, - Early Development in the Human. (Hast). 1972, 27.
 - Nerve Anastomosis in Dogs, - EMG and Visual Evaluation of. (Dedo). 1971, 54.
 - Obstruction (Nasal and Partial Laryngeal) in Dogs: Relationship between Pulmonary Resistance and Changes in Arterial Blood Gas Tension. (Ogura, Suemitsu, Nelson and Kawamoto) 1973, 61.
 - Papillomata or Carcinoma, - Place of CryoSurgery in Treatment of? (Miller, D.). 1973, 47.
 - Papillomata: Etiologic and Therapeutic Considerations. (Cook, Cohn, Goepfert, Brunschwig, Butel and Rawls). 1973, 40.
 - Physiology, Clinical Application of Recent Advances in. (Arnold). 1964, 91.
 - Problems, Unusual, in Children. (Jaffe). 1973, 15.
 - Stenosis, (Severe Acute or Chronic), Correction of: Double-post Teflon Tube Utilization. (Knight). 1966, 148.
 - Tracheal (and Laryngeal) Complications of Intubation. (Bryce, Briant and Pearson). 1968, 130.
 - Ventricle, Prolapse of. (Bryce). 1966, 161.
- Laryngectomy, Asai Technique for Vocal Rehabilitation after Total Laryngectomy. (Miller, A.). 1967, 141.
- Laryngectomy, Reconstructive: Report on the First 35 Cases. (Arslan). 1972, 122.
- Laryngitis, Allergic. (Williams, R.I.). 1972, 85.
- Laryngocele, - Approach to Internal, and Other Submucosal Lesions. (Yarington and Frazer). 1966, 155.
- Laryngomalacia, - Its Radiologic Demonstration. (Dunbar). 1967, 68.
- Laryngopharyngectomy (Total): Reconstruction with Tongue Flap and Dermal Grafts. (Loré). 1974, 90.
- Laryngopharyngectomy (Partial): Experience with. (Skolnik). 1964, 80.
- Laryngopharynx, - Histopathology in a Combined Radiation and Surgery Program for Advanced Carcinoma. (Goldman). 1966, 55.
- Laryngo-tracheal Autograft for Post-Cricoid Carcinoma. (Som). 1974, 95.
- Laryngo-tracheal Injuries. (Priest, Huff and Banovetz). 1967, 83.
- Laryngo-tracheal Injuries: Repair by "Trough" Method. (Bryce). 1967, 91.
- Laryngo-tracheal Trauma in Combat Casualty. (Miller, L.H.). 1970, 72.
- Larynx:
- Adenocarcinoma of. (Devine and Whicker). 1974, 102.
 - Adjustments, Subtle. (Moore). 1971, 74.
 - Approach to Internal Laryngocele, and Other Submucosal Lesions. (Yarington and Frazer). 1966, 155.
 - Articular Reflex Mechanisms. (Kirchner and Wyke). 1965, 16.
 - Bio-dynamics of Injury (Nahum). 1967, 78.
- Carcinoma of:
- Analysis of 311 Cases Treated Surgically. (Putney and Chapman). 1972, 11.
 - Diagnosis and Treatment by Surgery or Radiation. (Hayes, Atkins and Raventos). 1971, 15.
 - Laser (Carbon-dioxide) in. (Andrews). 1974, 75.
 - Neck Dissection (Elective), for Pharyngeal and Laryngeal Cancers. (Ogura, Biller and Wette). 1971, 35.
 - Post-Irradiation. (Baker and Weissman). 1971, 22.
 - Post-cricoid, - Autografts in. (Som). 1974, 95.
 - Studied by Serial Sections. (Kirchner). 1969, 119.
 - Supraglottic, - Clinical and Histologic Observations. (Kirchner and Som). 1971, 27.
 - Surgically Treated, - Correlation of Clinical Staging, Pathological Findings and Five-Year End Results. (Norris, Tucker, G.F., Kuo and Pitser). 1970, 110.
 - Treatment, - Current Status of Radiotherapy. (Garland) 1964, 160.
- Cardiovascular Reflexes from. (Kirchner and Suzuki). 1967, 71.
- Complications of Intubation. (Bryce, Briant and Pearson). 1968, 130.
- Congenital Anomalies (Webs, Cysts and Laryngoceles). (Holinger). 1967, 35.
- Dilemma of Delayed Radiation Injury. (Calcaterra, Stern and Ward, P.H.). 1972, 162.
- Diplophonia. (Ward, Sanders, J., Goldman, R. and Moore). 1969, 40.
- Edema of, - Experimental Study. (Biller, Bone, Harvey and Ogura). 1970, 68.

- Fractures (Experimental), Acute Treatment of. (Miles and Olson). 1971, 104.
- Glomus Tumor (Chemodectoma) of. (Baxter). 1965, 86.
- Histological Classification of Early Malignant Lesions, (Wied). 1966, 21.
- Histopathology in a Combined Radiation and Surgery Program for Advanced Carcinoma of. (Goldman). 1966, 55.
- Human Homo-transplantation. (Kluy-skens). 1970, 93.
- Hypothyroidism Effect in Rats: Explanation for Hoarseness in Humans. (Ritter). 1964, 65.
- Inflammatory Diseases of, in Infants and Children. (Davison) 1967, 45.
- Injuries, Acute Blunt, - Treatment of. (Olson and Miles) 1971, 98.
- Injuries, - Pharyngeal, Tracheal (and Laryngeal) in the Pediatric Age-Group. (Holinger and Schild). 1972, 46.
- Isolated Larynx, - Hyperbaric Perfusion of. (Briant, van Nostrand, Bryce, Lord and McClure). 1971, 44.
- Laser (Carbon-dioxide) - Experiences with. (Andrews). 1974, 75.
- Looking at, - during Running Speech. (Cooper, Abramson, Sawashima and Lisker). 1971, 69.
- Mucosal Pedicle Grafts for Late Glottic Stenosis. (Dedo and Sooy) 1968, 107.
- Observations on the Embryology of the Human Larynx. (Tucker, J.A. and O'Rahilly) 1972, 35.
- Papillary Lesions of, in Adults. (Friedberg, Stagman and Hass). 1971, 76.
- Papillomata, - Electron Microscopic Identification of Virus-like Particles in. (Boyle, McCoy and Fogarty). 1971, 87.
- Perfusion (Hyperbaric), of the Isolated Larynx. (Briant, van Nostrand, Bryce, Lord and McClure). 1971, 44.
- Physiology of the Fetal, (and Lung). (Adams, Desilets and Towers). 1967, 24.
- Post-Intubation Complications. (Ferguson and Strome). 1974, 35.
- Reconstructive Surgery Related to. (Farrior) 1970, 52.
- Replantation and Homotransplantation of, in Dogs. (Ogura, Kawasaki, Take-nouchi and Yagi). 1966, 37.
- Running Speech, - Looking at. (Cooper, Abramson, Sawashima and Lisker). 1971, 69.
- Serial Sections Analysis in Pre-operative Radiation. (Skolnik et al). 1970, 101.
- Stenosis, Chronic. (Baker). 1969, 60.
- Subglottic Stenosis of, - Surgical Correction of. (Fearon and Cotton). 1972, 57; 1974, 31.
- Super-Voltage Radiation Therapy for Carcinoma of. (Lathrop) 1968, 188.
- Supra-cricoid Laryngectomy. (Kitamura, Kaneko, Togawa and Unno). 1970, 94.
- Surgical Correction of Subglottic Stenosis: Preliminary Report). (Fearon and Cotton). 1972, 57.
- Surgical Correction of Subglottic Stenosis). (Fearon and Cotton). 1974, 31.
- Surgical Management of Supraglottic and Subglottic Stenosis of. (Montgomery). 1968, 114.
- Trauma, External (of Larynx and Trachea): Immediate Treatment and Management. (Pennington). 1972, 100.
- Tumors (Cartilaginous) of. (Putney and Moran). 1964, 26.
- Two-Stage Asai Technique of Laryngectomy (Putney and Bagley). 1970, 89.
- "Untreated" Carcinoma of. (Norris and Peale). 1968, 159.
- Laser (Carbon-dioxide) Experiences. (Andrews). 1974, 75.
- Lipoma of Epiglottis and Hypopharynx (Eagle) 1965, 133.
- Looking at the Larynx during Running Speech. (Cooper, Abramson, Sawashima and Lisker). 1971, 69.
- Lung (Fetal), - Physiology of (and Larynx). (Adams, Desilets and Towers). 1967, 24.
- Lymphoid Tissue (Central), Current Concepts in Immunology. (Hermans). 1968, 25.

M

- Malignant Lesions (Early) of Oral Cavity, Pharynx and Larynx: Histological Classification. (Wied). 1966, 21.
- Management of Chronic Inflammation of Salivary Glands. (Lathrop). 1964, 206.
- Management of Long-term Airway Problems in Infants and Children. (Fearon and Ellis). 1971, 60.
- Management of Total Nasal Blockage by Polyps of Allergic and Infectious Origin. (Sanders, S.H.). 1972, 73.
- Mast Cells in the Upper Respiratory Tract. (Schenck). 1965, 147.
- Mediastinum, - Exploration of, under Local Anesthesia. (Ward, Stephenson and Harris, P.F.). 1966, 114.
- MEMORIALS (See under "Obituaries").
- Metastatic Abscess as a Complication of Retrograde Esophageal Dilatation. (Rontal, Meyerhoff and Duvall). 1973, 21.
- Morphologic and Histologic Aspects of Human Ciliated Epithelial Cells in Nasal

- Secretions. (Bryan, W.T.K., Bryan, M.P. and Smith, C.A.). 1964, 145.
- Motility Studies (Esophagus) in Globus Sensation. (Calderelli, Andrews and Derbyshire). 1970, 32.
- Mucoceles of Frontal Sinus: Causes and Treatment. (Bordley and Bosley). 1973, 91.
- Mucosal Pedicle Grafts for Late Glottic Stenosis. (Dedo and Sooy). 1968, 107.
- Multiple Post-Intubation Complications. (Ferguson and Strome). 1974, 35.
- Muscle (Trapezius), - Nerve Grafting to Restore Function of (After Radical Neck Dissection). (Harris, H.H. and Dickey). 1965, 168.
- Muscles (Human, Laryngeal), - Early Development of. (Hast). 1972, 27.
- N
- Nasal Blockage (Total), by Polyps of Allergic and Infectious Origin. (Sanders, S.H.). 1972, 73.
- Nasal Cavity and Para-Nasal Sinuses, - Sarcoma of. (Lewis). 1969, 101.
- Nasal and Partial Laryngeal Obstruction: Relationships between Pulmonary Resistance and Changes in Arterial Blood Gas Tension. (Ogura, Nelson, Suemitsu and Kawamoto). 1973, 61.
- Nasopharynx, - Radiological Treatment of Juvenile Angiofibroma of. (Briant, Fitzpatrick and Book). 1970, 44.
- Neck:
- CryoSurgery in Tumors of Head and. (Miller, D.). 1969, 140.
- Dissection, Elective, - for Pharyngeal and Laryngeal Cancers. (Ogura, Biller and Wette). 1971, 35.
- Dissection (Radical Neck), - Nerve Grafting to Restore Function of Trapezius Muscle. (Harris, H.H. and Dickey). 1965, 168.
- Lanthanic Mass. (Lederer and Soboroff). 1968, 96.
- Preoperative Radiation in Cancer of Head and. (Skolnik, Tenta, Comito and Jerome). 1966, 78.
- Serial Central and Peripheral Biopsies of Combined Therapy of Cancer of. (Keim, Koeck and Sarkisian). 1968, 204.
- Specimens (Radical Neck): Histopathology in a Combined Radiation and Surgery Program for Advanced Carcinoma (Goldman). 1966, 55.
- Use of Double Transverse Incisions in Surgery of Head and. (Chandler and Ponzoli). 1969, 68.
- Neoplasms, Oral and Pharyngeal, - Complications Associated with Combined Therapy of. (Smits, Krause and McCabe) 1972, 132.
- Neoplasms, (Post-cricoid and Cervical Esophageal), - Role of Surgery in Management of. (Harrison) 1972, 132.
- Nerve, (Recurrent Laryngeal), Anastomosis in Dogs, - EMG and Visual Evaluation of. (Dedo). 1971, 54.
- Nerve Grafting to Restore Function of Trapezius Muscle after Radical Neck Dissection. (Harris, H., and Dickey). 1965, 168.
- Newborn, - Airway Problems: Treatment of. (Ferguson). 1967, 55.
- Non-Neoplastic Lesions of the Parotid Gland (Work). 1968, 151.
- Nose as Form and Function. (Williams, H.L.). 1969, 19.
- Nose, Baseline Values for Physiologic Surgery. (Ogura, Unno and Nelson). 1968, 53.
- Nose, Physiologic Methods for Controlling Nasal Polyposis and Vasomotor Rhinitis. (Weille). 1965, 122.
- O
- Obituaries:
- Alfaro, Victor Ricardo. 1974, 129.
- Atkins, Joseph Pitman. 1974, 132.
- Ballenger, Howard Charles. 1965, 180.
- Barlow, Roy Alexander. 1966, 174.
- Beatty, Hugh Gibson. 1972, 170.
- Campbell, Edward Hastings. 1964, 240.
- Dixon, Fred Willis. 1966, 175.
- Equen, Murdock Sykes. 1965, 183.
- Figi, Frederick Adams. 1970, 128.
- Furstenberg, Albert Carl. 1970, 131.
- Gittens, Thomas Roy. 1968, 234.
- Hall, Colby. 1965, 187.
- Hart, Verling Kersley. 1972, 172.
- Havens, Fred Z. 1966, 178.
- Hill, Frederick Thayer. 1970, 134.
- Hoople, Gordon Douglas. 1974, 135.
- Houser, Karl Musser. 1967, 170.
- Ireland, Percy E. 1974, 137.
- Jarvis, DeForest Clinton. 1967, 172.
- Keim, W. Franklin. 1972, 174.
- Kelly, Joseph Dominic. 1968, 236.
- Knight, John S. 1974, 139.
- Lederer, Francis Loeffler. 1974, 141.
- Lewis, Fielding Otis. 1965, 190.
- MacPherson, Duncan. 1966, 181.
- Martin, Robert Carson. 1965, 193.
- McMahon, Bernard John. 1972, 177.
- Meltzer, Philip Edward. 1967, 174.
- Nash, C. Stewart. 1971, 118.
- Pressman, Joel Jay. 1968, 239.
- Proetz, Arthur Walter. 1966, 184.

- Richards, Lyman Guilder. 1969, 149.
(Also 1969, 11).
- Robb, James Milton. 1964, 243.
- Roberts, Sam E. 1967, 178.
- Walsh, Theodore Edwin. 1971, 121.
- Whelan, Edward Joseph. 1966, 189.
- Woodward, Fletcher Drummond.
1970, 137.
- Obliteration of Frontal Sinus. (Goodale).
1965, 109.
- Observations on Embryology of Human
Larynx. (Tucker, J.A., and O'Rahilly).
1972, 35.
- Observations on Frontal Sinus Obliteration.
(Goodale). 1965, 109.
- Obstruction (Long-term Airway) in In-
fants and Children (Fearon and Ellis).
1971, 60.
- Obstruction (Nasal and Partial Laryngeal)
in Dogs: Relationships between Pulmo-
nary Resistance and Changes in Arterial
Blood Gas Tension. (Ogura, Nelson, Sue-
mitsu and Kawamoto). 1973, 61.
- Obstruction, - Relationship between Up-
per Airway and Pulmonary Function.
(Ogura, Nelson, Dammkoehler et al).
1964, 39.
- One-Hundred Laryngeal Cancers, - Stud-
ied by Serial Sections. (Kirchner). 1969,
119.
- Oral Cavity, - Cancer, - Prognosis and
Treatment (Five-Year End-Results)
(Trible). 1969, 110.
- Oral Cavity, Pharynx and Larynx, - His-
tological Classification of Early Malignant
Lesions of. (Wied). 1966, 21.
- Oral and Pharyngeal Neoplasms, - Compli-
cations Associated with Combined Ther-
apy of. (Smits, Krause and McCabe).
1972, 157.
- Oropharyngeal Cancer, Improvement in
Cure-rates from Combination Therapy.
(McCabe, Leonard, Litton and Latour-
ette). 1968, 211.
- Ossifying Fibroma of the Sinuses (Young,
F.W. and Putney). 1968, 84.
- Osteophytes (Cervical) and Dysphagia.
(Saunders) 1970, 25.
- Osteoplastic Frontal Sinus Approach: Cor-
onal Incision. (Montgomery). 1965, 94.
- Papilloma (Laryngeal), - Electron Micro-
scopic Identification of Virus-like Par-
ticles in. (Boyle, McCoy and Fogarty).
1971, 87.
- Papillomata or Carcinoma (Laryngeal):
Place of CryoSurgery in Treatment of?
(Miller, D.). 1973, 47.
- Papillomata (Laryngeal): Etiologic and
Therapeutic Considerations. (Cook,
Cohn, Brunschwig, Goepfert, Butel and
Rawls). 1973, 40.
- Paralysis (Bilateral, Vocal Cord) of Un-
determined Etiology: Clinical Course
and Outcome. (Neel, Townsend and De-
vine) 1972, 142.
- Parotid (Extra-), Disease Simulating Pa-
rotid Masses. (Nichols) 1972, 94.
- Parotid Gland, Non-malignant Lesions of.
(Work). 1968, 151.
- Pathological Findings. Five Year End Re-
sults in Treatment of Cancer of Larynx
by Surgery. (Norris, Tucker, G.F., Kuo
and Pitser). 1970, 110.
- Pectoral Skin Flaps, - Cutaneous Vascular
Anatomy of. (Calcaterra, Cherney and
Saffouri). 1973, 86.
- Pediatric Airway Problems in the Newborn
(Ferguson). 1967, 55.
- Pediatric Laryngo-Tracheo-Esophagology.
(Panel). 1973, 107.
- Pedicle Flap (Tubed), Use of, in Head and
Neck Surgery. (Weaver). 1967, 120.
- Perfusion (Hyperbaric) of the Isolated
Larynx. (Briant, van Nostrand, Bryce,
Lord and McClure). 1971, 44.
- Pharyngeal (and Laryngeal) Cancers, -
Elective Neck Dissection for. (Ogura,
Biller and Wette). 1971, 35.
- Pharyngeal Diverticulum. (Macbeth).
1971, 52.
- Pharyngeal Implants for Reduction of Air
Space in Velo-pharyngeal Insufficiency.
(Ward and Wepman). 1964, 110.
- Pharyngeal, Laryngeal and Tracheal In-
juries in the Pediatric Age-Group. (Hol-
inger and Schild). 1972, 46.
- Pharyngeal Symptoms (Chronic) Clinico-
histological Study of. (Rulon and
Simonton). 1964, 177.
- Pharynx:
- Cardiovascular Reflexes from. (Kirchner
and Suzuki). 1967, 71.
- Histological Classification of Early Ma-
lignant Lesions of. (Wied). 1966, 21.
- Laryngo-pharyngectomy (Partial), - Ex-
periences with. (Skolnik) 1964, 80.
- Teflon Injection of Posterior Wall, as
Aid to Velo-pharyngeal Closure. (Lewy
and Wepman). 1965, 160.

P

- Panel - Pediatric Laryngo-Tracheo-Esoph-
agology. 1973, 107.
- Panel - Voice Rehabilitation Following
Laryngectomy. 1974, 49.
- Papillary Lesions of the Larynx in Adults.
(Friedberg, Stagman and Hass). 1971,
76.

- Physiology (Fetal Larynx and Lung). (Adams, Desilets and Towers). 1967, 24.
- Physiology (Laryngeal), - Clinical Application of Recent Advances in. (Arnold). 1965, 91.
- Polychondritis in a Newborn, Presenting as Tracheomalacia. (Johner and Szanto). 1970, 77.
- Polyps of Allergic and Infectious Origin, - Management of Total Nasal Blockage by (Sanders, S.H.) 1972, 73.
- Polypsis (Nasal) and Vasomotor Rhinitis: Rhinological Methods for Control of. (Weille). 1965, 122.
- Post-cricoid Carcinoma: Laryngo-tracheal autografts in (Som). 1974, 95.
- Post-cricoid and Cervical Esophageal Neoplasms: Role of Surgery in the Management of. (Harrison). 1972, 132.
- Post-Irradiation Carcinoma of the Larynx. (Baker and Weissman). 1971, 22.
- Post-Intubation Complications, Multiple. (Ferguson and Strome). 1974, 35.
- Preoperative Radiation in Head and Neck Cancer. (Skolnik, Tenta, Comito, and Jerome). 1966, 78.
- Preoperative Radiation of Larynx: Analysis of Serial Sections. (Skolnik, Soboroff, Tardy, Levin and Tenta). 1970, 101.
- Presidential Addresses (Or Remarks) - (See under "Addresses").
- Problems of Airway in Newborns. (Ferguson). 1967, 55.
- Problems of Pediatric Laryngo-Tracheo-Esophagology (Panel), 1973, 107.
- Prolapse of the Laryngeal Ventricle. (Bryce). 1966, 161.
- Prosthetic Reconstruction of Tongue. (deFries). 1974, 85.
- Pulmonary Function - Relationships with Upper Airway. (Ogura et al). 1964, 39.
- Pulmonary Resistance and Changes in Arterial Blood Gas Tension in Dogs with Nasal and Partial Laryngeal Obstruction. (Ogura, Suemitsu, Nelson and Kawamoto). 1973, 61.
- R**
- Radiation:
- Analysis of Serial Sections of Larynx in Pre-operative. (Skolnik, Soboroff, Tardy, Levin and Tenta). 1970, 101.
- Delayed Radiation Injury of Larynx, - Dilemma of. (Calcaterra, Stern and Ward, P.H.) 1972, 162.
- High-dosage (Preoperative) - and Surgery for Carcinoma of Larynx and Laryngo-pharynx. (Goldman, J., Zak, Roffman and Birken). 1972, 148.
- Histopathology of Larynges and Radical Neck Specimens in a Combined Surgery Program for Advanced Carcinoma. (Godman, J.L.) 1966, 55.
- Pre-operative, in Head and Neck Cancer. Skolnik, Tenta, Comito and Jerome). 1966, 78.
- Super-Voltage Therapy of Carcinoma of Larynx. (Lathrop). 1968, 188.
- Therapy under Hyperbaric Conditions. (Saunders and Schloss). 1968, 170.
- Radiographic Findings in Advanced Cystic Carcinoma of Head and Neck. (Dodd and Jing). 1972, 65.
- Radiological Treatment of Juvenile Nasopharyngeal Angiofibroma. (Briant, Fitzpatrick and Book). 1970, 44.
- Radiology, - Laryngomalacia Demonstrated by. (Dunbar). 1967, 68.
- Recent Electron Studies with Special Reference to Respiratory Cilia. (Tremble). 1967, 148.
- Reconstruction of Hypopharynx with Tongue Flaps and Dermal Grafts. (Loré). 1974, 90.
- Reconstruction (Prosthetic) of Tongue. (deFries). 1974, 85.
- Reconstructive Laryngectomy: Report on First 35 Cases. (Arslan). 1972, 122.
- Reconstructive Surgery Related to Laryngology. (Farrior). 1970, 52.
- Reflexes (Cardiovascular) from the Larynx and Pharynx. (Kirchner and Suzuki). 1967, 71.
- Rehabilitation (Voice) Following Laryngectomy. (Panel). 1974, 49.
- Relationship between Upper Airway Obstruction and Pulmonary Function (Ogura et al). 1964, 39.
- Repair of Laryngo-tracheal Injuries by "Trough" Method. (Bryce). 1967, 91.
- Replantation and Homo-transplantation of the Dog Larynx (Ogura et al). 1966, 37.
- Resection (Segmental) and Anastomosis of Tracheal Stenosis. (Ward and Safouri). 1974, 106.
- Research (Clinical), - In Defense of. (Davison). 1969, 35.
- Respiratory Cilia, - Recent Electron Studies with Special Reference to (Tremble). 1967, 148.
- Respiratory Tract (Upper): Indications and Dangers of Corticosteroid Therapy. (Rawlins). 1968, 44.
- Respiratory Tract (Upper), - Mast Cells in (Schenck). 1965, 147.
- Retropharyngeal Hemorrhage from Carotid Arteries. (Weaver). 1964, 223.

Rhinological Methods for Controlling Nasal Polyposis and Vasomotor Rhinitis. (Weille). **1965**, 122.

Rhino-sinusitis, Hyperplastic. (Davison). **1973**, 100.

Richards, Lyman Guildler, M.D. - An Appreciation. (Ferguson) **1969**, 11.

Role of Surgery in Management of Post-cricoid and Cervical Esophageal Neoplasms. (Harrison). **1972**, 132.

S

Salivary Glands, Carcinoma in Pleomorphic Adenomas of. (Boles, Johns and Batsakis). **1973**, 78.

Salivary Glands, Management of Chronic Inflammation of. (Lathrop). **1964**, 206.

Sarcoma of Nasal Cavity and Paranasal Sinuses. (Lewis). **1969**, 101.

Segmental Resection and Anastomosis of Tracheal Stenosis. (Ward and Saffouri). **1974**, 106.

Sinus, (Frontal) - Mucocoeles of: Causes and Treatment. (Bordley and Bosley). **1973**, 91.

Sinuses Ossifying Fibroma of. (Young, F.W. and Putney). **1968**, 84.

Sinuses (Paranasal), - Sarcoma of. (Lewis). **1969**, 101.

Sinusitis, Hyperplastic. (Davison) **1973**, 100.

Skin Flaps (Pectoral), Cutaneous Vascular Anatomy of. (Calcaterra, Cherney and Saffouri). **1973**, 86.

Solis-Cohen, Dr. - Pioneer Laryngologist. (Clerf). **1972**, 23.

Some Aspects of Fetal Laryngeal Development. (Tucker, J.A.). **1974**, 24.

Speech (Running), - Looking at Larynx in. (Cooper, Abramson, Sawashima and Lisker). **1971**, 69.

Staging (Clinical): Correlation of Pathological Findings and Five-Year End Results in Surgically Treated Cancer of Larynx. (Norris, Tucker, G.F., Kuo and Pitser). **1970**, 110.

Stenosis:

Laryngeal, Chronic. (Baker). **1969**, 60.

Laryngeal, - Correction of Severe Acute or Chronic: Double-post Teflon Tube Utilization (Knight) **1966**, 148.

Subglottic, Surgical Correction of. (Fearon and Cotton). **1972**, 57, and **1974**, 31.

Surgical Management of Supraglottic and Subglottic. (Montgomery). **1968**, 114.

Tracheal, Segmental Resection and Ana-

stomosis. (Ward, and Saffouri). **1974**, 106.

Use of Mucosal Pedicle Graft in. (Dedo and Sooy). **1968**, 107.

Steroid Treatment of Hemangiomas of Head and Neck in Children. (Cohen and Wang). **1972**, 39.

Stop the Medicine (DeWeese). **1969**, 38.

Subglottic Stenosis, Surgical Correction of. (Fearon and Cotton. **1972**, 57 and **1974**, 31.

Subglottic Stenosis, Surgical Management of. (Montgomery) **1968**, 114.

Supra-cricoid Laryngectomy (Kitamura et al) **1970**, 94.

Supraglottic Cancer: Clinical and Histological Observations. (Kirchner and Som). **1971**, 27.

Surgery:

Baseline Values in Pulmonary Mechanics for Physiological Surgery of Nose. (Ogura, Unno and Nelson). **1968**, 53.

Histopathology of Larynges and Radical Neck Specimens in a Combined Surgery and Radiation Program for Advanced Carcinoma of Larynx (Goldman) **1966**, 55.

Irradiation or Surgery: Diagnosis and Treatment of Cancer of the Larynx. (Hayes, Atkins and Raventos). **1971**, 15.

Management of Supraglottic and Subglottic Stenosis. (Montgomery) **1968**, 114.

Role of, in Management of Post-cricoid and Cervical Esophageal Neoplasms. (Harrison). **1972**, 132.

Use of Tubed Pedicle Flap in Head and Neck. (Weaver). **1967**, 120.

Surgical Correction of Choanal Atresia. (Cherry and Bordley) **1966**, 127.

Surgical Correction of Subglottic Stenosis. (Fearon and Cotton). **1972**, 57; **1974**, 31.

Surgical and Prosthetic Resection of Tongue. (deFries). **1974**, 85.

T

Teflon Injection (Intra-cordal) in Treatment of Dysphonia. (Dedo, Urrea and Lawson). **1973**, 53.

Teflon Injection of Posterior Pharyngeal Wall as an Aid to Velo-palatal Closure. (Lewy and Wepman). **1965**, 160.

Teflon Tube Utilization: Correction of Severe Acute or Chronic Laryngeal Stenosis. (Knight). **1966**, 148.

Therapy (Combined Radiation and Surgical): Improvement in Cure-rates of Oropharyngeal Cancer. (Leonard, Litton,

- Latourette and McCabe). 1968, 211.
- Therapy - Serial Central and Peripheral Biopsies in Head and Neck Cancer. (Keim, Koeck and Sarkisian). 1968, 204.
- Therapy (Voice): Laryngeal Changes during. (Brewer and McCall). 1974, 19.
- Three Years of CryoSurgery in Head and Neck Tumors. (Miller, D.). 1969, 140.
- Tongue Flap and Dermal Grafts in Reconstruction of Hypopharynx (Loré). 1974, 90.
- Tongue, Reconstruction of (Surgical and Prosthetic) (deFries) 1974, 85.
- Trachea:
- Carcinoma of. (Acquarelli) 1967, 158.
 - Complications of Intubation of. (Bryce, Briant and Pearson). 1968, 130.
 - Decannulation Problems in Infants. (Baker and Savetsky). 1972, 54.
 - Histologic Changes Following Tracheostomy. (Friedberg, Griffiths and Hass). 1965, 53.
 - Immediate Management of External Trauma to Larynx and Trachea. (Pennington). 1972, 100.
 - Stenosis: Segmental Resection and Anastomosis. (Ward and Saffouri). 1974, 106.
 - Ultra-structure of Cilia and Cells during Regeneration. (Hilding, A.C. and Hilding, D.A.). 1966, 22.
- Tracheal, Laryngeal and Pharyngeal Injuries in Pediatric Age-Group; (Holinger and Schild). 1972, 46.
- Tracheo-esophageal Fistula (Congenital) Diagnosis and Surgical Management. (Cohen). 1970, 36.
- Tracheomalacia, Polychondritis in Newborn Presenting as. (Johner and Szanto). 1970, 77.
- Tracheostomy, - Histologic Changes in Trachea Following. (Friedberg, Griffith and Hass). 1965, 53.
- Transplantation of Vocal Cords in Dogs (Cherry et al) 1970, 80.
- Trauma (External) of Larynx and Trachea: Immediate Management of. (Pennington). 1972, 100.
- Treatment:
- Acute Blunt Laryngeal Injuries. (Olson and Miles). 1971, 98.
 - Airway Problems in the Newborn. (Ferguson). 1967, 55.
 - Choanal Atresia (Congenital) (Ferguson). 1964, 127.
 - Juvenile Nasopharyngeal Angiofibroma by Radiotherapy. (Briant, Fitzpatrick and Book). 1970, 44.
 - Steroid; of Hemangiomas of Head and Neck in Children. (Cohen and Wang). 1972, 39.
 - Vocal Cord Carcinoma by Vertical Hemilaryngectomy. (Leonard, Holt and Maran). 1972, 111.
 - "Trough" Method of Repair of Laryngo-tracheal Injuries. (Bryce). 1967, 91.
 - Two-Stage Asai Technique of Laryngectomy. (Putney and Bagley). 1970, 89.
 - Tubed Pedicle Flap: Use in Head and Neck Surgery. (Weaver). 1967, 120.
- Tumors:
- CryoSurgery in Head and Neck. (Miller, D.), 1969, 140.
 - Cartilaginous, of Larynx. (Putney and Moran). 1964, 26.
 - Glomus, of Larynx (Chemodectoma). (Baxter). 1965, 86.
- U
- Ultra-structure of Tracheal Cilia and Cells during Regeneration (Hilding, A.C. and Hilding, D.A.). 1966, 22.
 - "Untreated" Carcinoma of Larynx. (Norris and Peale). 1968, 159.
 - Unusual Laryngeal Problems in Children. (Jaffe). 1973, 15.
 - Upper Airway Problems in Severely Burned Patients. (Reed and Camp). 1969, 49.
 - Use of Dermal Grafts in Otolaryngology. (Reed). 1965, 36.
 - Use of Double Transverse Incision in Major Head and Neck Surgery. (Chandler and Ponzoli). 1969, 68.
 - Use of Mucosal Pedicle Graft for Glottic Stenosis. (Dedo and Sooy). 1968, 107.
 - Use of Tubed Pedicle Flap in Head and Neck Surgery. (Weaver). 1967, 120.
- V
- Vasomotor Rhinitis and Nasal Polyposis: Rhinological Methods for Control. (Weille). 1965, 122.
 - Vascular (Cutaneous) Anatomy of Pectoral Skin Flaps. (Calcaterra, Cherney and Saffouri). 1973, 86.
 - Velopalatal Closure: Teflon Injection of Posterior Pharyngeal Wall (Lewy and Wepman) 1965, 160.
 - Velopalatal Insufficiency: Pharyngeal Implants for Reduction of Air space: Experimental Study. (Ward and Wepman). 1964, 110.
 - Ventricle (Laryngeal) - Prolapse of. (Bryce). 1966, 161.
 - Virus-like Particles in Laryngeal Papilloma: Electron Microscopic Identifica-

- tion of. (Boyle, McCoy and Fogarty). **1971**, 87.
- Visible Laryngeal Changes during Voice Therapy (Fiber-optic Study). (Brewer and McCall). **1974**, .
- Visual and EMG Evaluation of Recurrent Laryngeal Nerve Anastomosis in Dogs. (Dedo). **1971**, 54.
- Vocal Cord:
- Carcinoma: Treatment by Vertical Hemilaryngectomy. (Leonard, Holt and Maran). **1972**, 111.
- Injection (Intracordal) of Teflon in Treatment of Dysphonia (Dedo, Urrea and Lawson). **1973**, 53.
- Paralysis (Bilateral) of Undetermined Etiology: Clinical Course and Outcome. (Neel, Townsend and Devine). **1972**, 142.
- Transplantation in Dogs. (Cherry, Davis, Rosenblatt and Coleman). **1970**, 80.
- Vocal Rehabilitation: Asai Technique after Total Laryngectomy. (Miller, A.). **1967**, 141.
- Voice-print Technique: Application to Vocal Tract Analysis. (Kersta). **1967**, 106.
- Voice Rehabilitation Following Laryngectomy (Panel). **1974**, 49.
- Voice Therapy: Visible Laryngeal Changes during. (Brewer and McCall). **1974**, 19.

Z

- Zenker's (Hypopharyngeal) Diverticulum. (Holinger and Schild) **1969**, 82.

INDEX

to the

TRANSACTIONS

of the

AMERICAN
LARYNGOLOGICAL ASSOCIATION

1974

AUTHORS INDEX

A

Andrews, Albert H., Jr., M.D. 75

B

Brewer, David W., M.D. 19

C

Conley, John J., M.D. 49

Cotton, Robin, M.D. 31

D

de Fries, Hugh O., D.D.S., M.D.,
Capt., USN 85

Devine, Kenneth D., M.D.102

F

Fearon, Blair, M.D. 31

Ferguson, Charles F., M.D. 35

FitzHugh, G. Slaughter, M.D.,
(President) 11

G

Goodale, Robert L., M.D.,
(Guest of Honor) 17

K

Komorn, Robert M., M.D. 55

L

Lavelle, William G., M.D. 62

Lierle, Dean M., M.D. 18

Loré, John M., Jr., M.D. 90

M

McCall, Gerald, Ph.D. 19

Miller, Alden H., M.D. 71

Montgomery, William W., M.D. 62

Moss, Harold W., M.D. 75

N

Neel, H.B. III, M.D.102

O

Ogura, Joseph H., M.D. 43

S

Saffouri, Muhammed, M.D.106

Sessions, Donald G., M.D. 43

Som, Max L., M.D. 95

Strome, Marshall, M.D. 35

Swain, Ronnie E., M.D. 43

T

Taub, Stanley, M.D. 51

Tucker, Gabriel F., M.D. 24

Tucker, John A., M.D. 24

W

Ward, Paul H., M.D.106

Weiland, Louis H., M.D. 102

Whicker, J. H., M.D.102

SUBJECT INDEX

A

Address, Presidential (FitzHugh)	11
Adenocarcinoma of the Larynx (Whicker, Neel, Weiland and Devine)	102
American Board of Otolaryngology - Fifty Years (Lierle)	18
Anastomosis and Surgical Resection of Cervical Trachea (Ward and Saffouri)	106
Aspects of Fetal Laryngeal Development (Tucker and Tucker)	24
Autograft (Laryngotracheal) for Postcricoid Carcinoma (Som)	95

C

Carbon-Dioxide Laser; Experiences in Larynx (Andrews and Moss)	75
Carcinoma, Postcricoid; Laryngotracheal Autograft in (Som)	95
Complications, Multiple, Post-Intubation (Strome and Ferguson)	35

D

Dermal Graft and Tongue Flap in Reconstruction of Hypopharynx Following Total Laryngectomy (Loré)	90
Development (Laryngeal, Fetal) (Tucker and Tucker)	24

E

Experiences with the Carbon-Dioxide Laser in the Larynx (Andrews and Moss)	75
--	----

F

Fetal Laryngeal Development (Tucker and Tucker)	24
Fiber-Optic Study - Visible Laryngeal Changes during Voice Therapy (Brewer and McCall)	19
Fibrosarcoma of Head and Neck (Treatment and Results) (Swain, Sessions and Ogura)	43

G

Guest of Honor Remarks (Goodale)	17
---	----

H

Head and Neck, Fibrosarcoma of (Treatment and Results) (Swain, Sessions and Ogura)	43
Hypopharynx, Reconstruction Following Laryngopharyngectomy, Utilizing Tongue Flap and Dermal Graft (Loré)	90

I

Introduction of Guest of Honor, Robert L. Goodale, M.D. (FitzHugh)	16
Intubation (Post-), Multiple Complications (Strome and Ferguson)	35

L

Laryngeal Changes (Visible) during Voice Therapy, (Fiber-Optic Study) (Brewer and McCall)	19
Laryngeal Development (Fetal) (Tucker and Tucker)	24
Laryngopharyngectomy (Total), Reconstruction of Entire Hypopharynx Utilizing Tongue Flap and Dermal Graft (Loré)	90
Laryngotracheal Autograft for Postcricoid Carcinoma (Som)	95
Larynx:	
Adenocarcinoma of (Whicker, Neel, Weiland and Devine)	102
Carbon-Dioxide Laser; Experiences in the Larynx (Andrews and Moss)	75
Carcinoma, Postcricoid; Laryngotracheal Autografts in (Som)	95
Laser, (Carbon-Dioxide) Experiences in Larynx (Andrews and Moss)	75
Post-Intubation Complications, Multiple (Strome and Ferguson)	35
Subglottic Stenosis, Surgical Correction of (Fearon and Cotton)	31
Surgical Correction of Subglottic Stenosis (Fearon and Cotton)	31
Laser (Carbon-Dioxide); Experiences in the Larynx (Andrews and Moss)	75

- M
- Multiple Post-Intubation Complications
(Strome and Ferguson) 35
- P
- PANEL. Voice Rehabilitation
Following Laryngectomy 49
- Postcricoid Carcinoma;
Laryngotracheal Autograft in
(Som) 95
- Post-Induction Complications, Multiple
(Strome and Ferguson) 35
- Presidential Remarks (Fitz-Hugh) 11
- Prosthetic Reconstruction of Tongue
(deFries) 85
- R
- Reconstruction of Hypopharynx
Following Total
Laryngopharyngectomy, Utilizing
Tongue Flap and Dermal Graft
(Loré) 90
- Reconstruction (Prosthetic) of Tongue
(deFries) 85
- Rehabilitation (Voice), Following
Laryngectomy (Panel) 49
- Resection, (Segmental) and Anastomosis
of Tracheal Stenosis
(Ward and Saffouri) 106
- S
- Segmental Resection and Anastomosis
of Tracheal Stenosis
(Ward and Saffouri) 106
- Some Aspects of Fetal Laryngeal
Development (Tucker and Tucker) .. 24
- Stenosis (Subglottic); Surgical
Correction of (Fearon and Cotton) 31
- Stenosis, (Tracheal), Segmental
Resection and Anastomosis
(Ward and Saffouri) 106
- Subglottic Stenosis, Surgical
Correction of (Fearon and Cotton) 31
- Surgical Correction of Subglottic
Stenosis (Fearon and Cotton) 31
- Surgical and Prosthetic Resection of
Tongue (deFries) 85
- T
- Therapy (Voice); Laryngeal Changes
during (Fiber-Optic Study)
(Brewer and McCall) 19
- Tongue Flap and Dermal Graft; in
Reconstruction of Entire
Hypopharynx Following
Laryngopharyngectomy (Loré) 90
- Tongue, Reconstruction of;
(Surgical and Prosthetic)
(deFries) 85
- Tracheal Stenosis; Segmental Resection
and Anastomosis of
(Ward and Saffouri) 106
- V
- Visible Laryngeal Changes during
Voice Therapy (Fiber-Optic Study)
(Brewer and McCall) 19
- Voice Rehabilitation Following
Laryngectomy (Panel) 49
- Voice Therapy; Visible Laryngeal
Changes during (Fiber-Optic Study)
(Brewer and McCall) 19

