

Cancer Goals And Progress Discussed At Staff Symposium

MDAH staff and faculty members met October 3, 1970, at the request of Dr. R. Lee Clark, to consider the present status of cancer research and therapy and to determine the proper direction of activities for expediting solution of the cancer problem. The symposium was organized to provide data to the National Panel of Consultants on the Conquest of Cancer, of which Dr. Clark is co-chairman. This panel was established following a resolution in April, 1970, by U. S. Senator Ralph Yarborough which called for the elimination of cancer as a national problem.

Coordination Stressed

Several major points received emphasis at the staff symposium. The first was the need for unification and coordination of all areas and disciplines currently involved with cancer. Achievement of this coordination will require wider and more rapid communication among all levels of workers. Consensus was fairly widespread that workers should focus on a well-defined portion of the total cancer problem and from study of this model develop a good understanding of basic processes. A highly disciplined and directed program might be developed by devoting a whole institution to the solution of one problem in a manner resembling the Manhattan Project for development of the atomic bomb. Scientists generally noted the lack of funds and trained manpower as roadblocks to accelerated progress.

Areas studied in depth by the symposium included cancer control, basic research, therapeutics, and communications. The proceedings of the symposium were collected under the title, "Cancer Today—The State of the Art." The series of questions on cancer was considered by 12 staff study groups.



Dr. Robert Hickey (left) and Dr. R. Lee Clark (center) discuss the staff symposium with Dr. Margaret Sloan from the Division of Regional Medical Programs of the Health Service and Mental Health Administration, Rockville, Maryland; Mr. Robert F. Sweek, Director of Special Staff for the National Panel of Consultants for the Conquest of Cancer, National Cancer Institute; and Mr. Carl M. Fixman, Deputy Director of the Panel.

Cancer Control

In the field of cancer control, it was noted that cancer of the colon and leukemia-lymphoma have maximum potential for control and could serve as useful subjects of a large-scale program of cancer control. Critical evaluation was made of current techniques of screening such as exfoliative cytology, biochemical assays, and thermography; the recommendation was made that potential screening tests involving immune reactions and changes in the physical structures of compounds in the body fluids be studied further. Another major thrust in cancer control should be aimed at improving, increasing, or reactivating cancer training programs and projects.

Basic Research

Basic researchers discussed the concept of a cancer "epidemic" from carcinogenic viruses. Expression of these
(Cancer, Continued on Page 2)

Trophoblastic Disease Center Offers HCG Assays

Physicians in over a dozen south and south central states are being encouraged to use the facilities at the Trophoblastic Disease Center at MDAH for assay for trophoblastic disease. The radioimmunoassay, which measures the amount of human chorionic gonadotropin (HCG) present in women who have or who are suspected of having trophoblastic neoplasms, is available gratis to all physicians desiring such service.

The Center was set up in 1967 under the guidance of full-time MDAH staff and faculty members with temporary funds from the U. S. Public Health Service. It currently is seeking support from the Regional Medical Program. Since its opening, the Center has done a steadily increasing number of assays and pres-

ently averages 120 to 150 per month.

MDAH staff members connected with the operation of the Center are: Dr. Julian P. Smith, assoc. gynecologist and asst. prof. of gynecology; Dr. Felix N. Rutledge, gynecologist, prof. and head of gynecology; Dr. H. Stephen Gallager, assoc. pathologist and assoc. prof. of pathology; and Dr. Naguib A. Samaan, assoc. internist, assoc. prof. of medicine, and head, sec. of endocrinology. These staff members are also available for consultation.

Other trophoblastic disease centers in the U. S. are located at Harvard Medical School, Boston; Roswell Park Memorial Hospital, Buffalo; Duke University Medical School, Durham; Northwestern
(HCG, Continued on Page 2)

(Cancer, Continued from Page 1)

viruses may be controlled by a variety of internal and external factors. Cell biology research is currently directed toward determination of the mechanisms of control of cellular function, and this group of scientists proposed setting up a model for artificial assembly of a cell. Biochemists emphasized study of chemical interactions between cells, hormone production by tumors, and the role of gene repression and expression in carcinogenesis. Physicists expressed concern with repair and proliferation kinetics of irradiated cells, radioactive labeling of antibodies specific to viruses, and improving the combination of conservative surgery and irradiation.

Surgeons recommended more biopsies of suspicious areas with better instruments and techniques, and improvement of anesthetic management of patients

undergoing extensive surgical procedures for cancer. It was suggested that surgical procedures could aid diagnosis by extending the use of first- and second-look operations.

Communications

In the field of communications, proposals were made for establishment of a system of interdisciplinary review journals and for speeding dissemination of material at the prepublication stage. A computerized literary retrieval system, which will greatly facilitate literature research, is currently underway; the goal is 500,000 citations.

In closing remarks, Dr. Clark noted that each participant in the symposium "should have a broader base of information about cancer today than he had yesterday."



Thorikild Engen and Col. Edmund Lauder, both speakers at the clinical conference, found time to exchange ideas over a cup of coffee.

Grants for Research

Two grants from the U. S. Public Health Service and one from the American Cancer Society are among those presented recently to MDAH investigators.

Dr. E. J. Freireich was awarded a grant by the American Cancer Society for study of leukocyte transfusion as supportive therapy for the myelosuppressive effects of chemotherapy. This award was the first one to MDAH under the new Clinical Investigation Program of the Society. Freireich also proposes to study the transfusion of granulocytes and the direct transfer of specific immunologic information within human peripheral blood lymphocytes.

Dr. Freireich also received an award from the Public Health Service to establish training in clinical pharmacology and experimental therapeutics. Trainees will work closely with clinical scientists in development of drugs for control of malignant disease in man. The evaluation of drugs in cancer patients and of response to therapy will be emphasized.

Dr. Emil Frei, III received a grant from the Public Health Service to foster the implementation of experimental therapeutic studies in man. Frei's project would establish an integrated chemotherapy program, drawing together individuals from many interrelated fields such as immunology, pharmacology, and biostatistics, to optimize clinical trials in terms of patient safety and response.

shipment of the samples. Results are obtained in 5 to 7 days and are mailed out immediately. Samples should be shipped AIR SPECIAL to: The University of Texas M. D. Anderson Hospital and Tumor Institute at Houston, Trophoblastic Disease Center—T8C, Texas Medical Center, Houston, Texas 77025.



Two members of the panel on rehabilitation of the cancer amputee discussed different aspects of that problem. Billy Anderson (left) discussed vocational problems, and surgeon Darrell Shea lectured on immediate postoperative fitting of a prosthesis.

(HGC, Continued from Page 1)

Medical School, Chicago; Memorial Hospital, New York; and the University of Washington, Seattle.

Trophoblastic disease, a relatively rare disease, results from abnormal proliferation of the trophoblastic cells of the human placenta. Unless diagnosis, ther-

apy, and follow-up are prompt and thorough, prognosis is uniformly poor. But the tumors secrete human chorionic gonadotropin, and determination of the level of this hormone in blood or urine allows reliable and accurate diagnosis. When the neoplasm is recognized in its early stages, cure can be achieved in a high percentage of patients.

Because gonadotropin quantification is relatively expensive and complicated, the regional scope of the MDAH Center makes available on a free basis to community physicians laboratory and consultative facilities which are not economical on a local level.

Specimens for free assay should be serum samples taken from 20 cc. of freshly drawn blood. If urine is sent, it should be packed in dry ice. The Center provides small styrofoam containers for

The NEWS LETTER of The University of Texas M. D. Anderson Hospital and Tumor Institute at Houston, Houston, Texas 77025, is published quarterly to give information of the activities and policies of the institution to the physicians of Texas. IT IS MADE POSSIBLE BY A GIFT FROM MRS. HARRY C. WEISS.

Editor: Joan McCay

Associate Editor: Wendelyn White

Assistant Editor: Deborah Rylander

Photography: Medical Communications

Switzer Receives Heath Award At Conference

The fifth annual Heath Award was presented during the 1970 MDAH Clinical Conference on Cancer to Miss Mary E. Switzer, formerly administrator of the Social and Rehabilitation Service of the Department of Health, Education, and Welfare, and now vice president of the World Rehabilitation Fund in Washington, D. C.

The Heath Award is presented annually to a physician or scientist for an outstanding contribution to the better care of cancer patients through the clinical application of basic research knowledge. The recipient of the award then delivers the Heath Memorial Lecture as part of the Clinical Conference.

The 15th Annual Clinical Conference was held November 19 and 20, 1970, to discuss progress in the rehabilitation of the cancer patient. After presentation of the award to her by Dr. R. Lee Clark, President and prof. of surgery at MDAH, Miss Switzer delivered the Heath Memorial Lecture, entitled "Rehabilitation—An Act of Faith." The paper was a plea for "mobilization of commitment and belief" in rehabilitation. "Never close the door on anybody" is the foundation of her service philosophy, and



Assisted by MDAH President, Dr. R. Lee Clark, Heath Award recipient Mary Switzer views the citation and medallion presented to her at the opening session of the conference.

she believes that hope is a crucial factor in rehabilitation. Miss Switzer also expressed disappointment that the concept of rehabilitation has not gained more widespread acceptance.

Miss Switzer became interested in medical service in 1934 when she was assigned a supervisory position in the U. S. Public Health Service. Since then, through positions she has held in various federal social agencies, she has worked to expand federally financed services to millions of disabled people.

A native of Newton, Massachusetts, Miss Switzer graduated from Radcliffe College in 1921. Subsequently, she has received more than 14 honorary degrees. Awards that she has received include the Albert Lasker Award for contributions to international rehabilitation programs, the National Civil Service Award, the Hadassah Myrtle Wreath Award, the Dignity of Man Award of the Kessler Institute for Rehabilitation, the Distinguished Service Medal from the National Society for Crippled Children and Adults, the George Deaver Award of the Institute for the Crippled and Disabled, and the Department of Health, Education, and Welfare Distinguished Service Award.

The Heath Award was presented to Miss Switzer for her dedicated work in rehabilitation of the disabled. As commissioner of the Vocational Rehabilitation Administration, later called the Social and Rehabilitation Service, she was successful in obtaining grant funds for the rehabilitation of cancer patients. She also was instrumental in coordinating the activities of welfare and rehabilita-

tion agencies and in establishing job training and opportunities for the rehabilitated.

The Heath Award was established by William W. and Mavis B. Heath in memory of Mr. Heath's brothers, Guy and Dan. His brother Gilford's name was added to the award this year. Guy H. Heath was vice president of what is now the First City National Bank of Houston. Dan C. Heath served as principal and superintendent of numerous schools throughout the state. Gilford G. Heath was chief examiner for the Arizona insurance department at the time of his death in 1968.

A prominent Austin attorney, W. W. Heath was chairman of the Board of Regents of The University of Texas from 1962 to 1966. In April 1967, he was appointed U. S. Ambassador to Sweden.



Surrounded by microphones, in deep concentration, Dr. Milam Leavens ponders a question about neurological problems in cancer patients.



Dr. Richard Jesse, a member of the program committee for the meeting, chaired the session on rehabilitation problems in patients with cancer of the head and neck.

Radiologists and Physicists Meet

A joint meeting of the Texas Radiological Society, the Regional Medical Program of Texas, and the Texas Regional Medical Physicists was held October 24, 1970, at the MDAH auditorium. Lymphoma and carcinoma of the breast were the subjects of the two morning panel discussions. The afternoon session included discussion of neutron beam therapy, clinical applications of californium in radiation therapy, hyperbaric oxygen therapy, and tourniquet-induced hypoxia in soft-tissue sarcoma of the distal extremities.

BOOK REVIEWS

Breast Cancer, Early and Late, a collection of papers presented at the MDAH clinical conference on breast cancer, was published by Year Book Medical Publishers in early 1970. The monograph was the eighth in the continuing series of publications of the proceedings of the annual conference. Comprehensive in scope, the volume explores the basic concepts of breast cancer and reviews current trends in diagnosis, evaluation, and management of breast cancer in all stages.

The first section of the book presents epidemiologic, etiologic, and statistical information on breast cancer. Dr. D. E. Anderson discusses the etiologic importance of genetic factors. The role of steroid metabolite excretion in the etiology of cancer is reported by Dr. R. D. Bulbrook.

The second section is concerned with diagnosis and evaluation. The preferred method of breast examination and the diagnostic merits of mammography, thermography, and xeroradiography are discussed.

The bulk of the book is concerned with the management of early and advanced breast cancer through surgical, chemotherapeutic, and radiotherapeutic means.

The merits of classical, modified, and extended radical mastectomy are compared for different cases. The merits of surgical adjunctive chemotherapy and

Howe in Charge of Clinics

Effective April 1, 1970, Dr. Clifton D. Howe, head of the MDAH dept. of medicine since 1948, was named Associate Director (of Clinics) and Chief of Clinics at MDAH. He now is one of four associate directors who serve in an administrative capacity in various operations of the institution. The others are in the areas of education, research, and clinical research.

The Chief of Clinics is responsible for the compliance of all admissions with institutional regulations. He recommends policy and budget changes, assures the smooth running of the clinics, and directs nursing and classified personnel. In addition to the clinics, facilities under his supervision include the systems engineering, appointments, insurance, and admissions departments.

In October, Dr. Howe announced the arrangement of the Out-Patient Clinic into the following six sections: treatment and observation, head and neck, surgery, developmental therapeutics and pediatrics, medicine, and gynecology.

irradiation are reviewed in several papers as is effectiveness of peripheral lymphatics irradiation. The use of palliative surgical and electron beam treatment of the chest wall for management of locally advanced carcinoma and local recurrences is described.

A discussion of the necessity for post-treatment evaluations precedes sections on local therapy and systemic therapy.

Of special interest in *Breast Cancer, Early and Late* is the section on special problems which includes discussion of pregnancy and breast cancer, in situ lobular carcinoma, sarcomas of the breast, and cancer of the male breast. Because of the recent recognition that cancer frequently develops in the contralateral breast within 10 years of mastectomy for carcinoma, Dr. Jerome A. Urban proposes generous biopsy of the contralateral breast at the time of mastectomy with possible prophylactic removal of the remaining breast.

Dr. C. D. Haagensen of the Breast Clinics of the Columbia-Presbyterian Medical Center in New York, presented the Heath Memorial Lecture on "Carcinoma of the Breast in Its Earlier Stages." He describes clinical and pathologic methods for studying breast carcinoma that have evolved at Columbia and the recent modification in their plan of treatment.

Breast Cancer, Early and Late is available from Year Book Medical Publishers, Chicago, at a cost of \$14.50.

Genetic Concepts and Neoplasia, a collection of papers presented at MDAH's 1969 symposium on fundamental cancer research, was published in 1970. The volume, which is concerned with the role of genetics in carcinogene-

sis, is available from the Williams and Wilkins Company, Baltimore, for \$17.00.

The major topics of the book are the role of genetic change in neoplasia, interactions between the genetic apparatus and exogenous agents, the genetics of somatic cells, and repair of genetic defects.

Of interest in the first section are articles on the use of chromosome markers to study cancerogenesis and radiation dose-response relationships. The familial distribution patterns of a number of neoplasms and the high association of specific neoplasms with certain congenital defects are also discussed. Bertner Award lecturer Boris Ephrussi reviews the use of somatic hybridization in genetic analysis and correlates the mechanisms of neoplasia with those of normal development and differentiation. Dr. N. B. Atkin advocates the study of chromosome changes for recognizing precancerous stages.

The second section presents a more specialized study of chemical and viral mechanisms involved in cell transformation and induction of chromosome abnormalities. Structural and ultrastructural aspects of chromosome damage by radiation and other agents are also considered.

The final section is devoted to characterization of the cellular system for excision-repair of DNA. Several articles investigate the nature of the DNA rejoining process, and one discusses a family of enzymes which can perform the final rejoining step. Drs. K. L. Yielding and David Gaudin propose that the effectiveness of antitumor treatment may be increased by inhibition of the repair system in cancerous cells.

Summer Science Student Returns

Ten years ago J. Edward Okies was a high school student interested in science and medicine. Because of this interest and his scholastic achievements, he was chosen to participate in the first summer research training program at MDAH under a National Science Foundation grant.

Today Dr. Okies is a third year resident in surgery at the Baylor College of Medicine. He is working at MDAH in the gastrointestinal service of the dept. of surgery as a part of Baylor's three-month rotation program.

Dr. Okies is a good example of the multiple role MDAH plays in training medical personnel and in stimulating interest in the medical sciences.

The summer science training program

in which he participated began in 1960 with 16 students. Because of the exceptionally high student interest and the quality of the work accomplished, the program has been in continuous operation since then. Prior to 1960, training had been available to high school students under individual programs in the depts. of epidemiology, biology, biochemistry, and physics.

Student projects are directed by established investigators. Dr. Okies did research in physics under the direction of Dr. Robert J. Shalek, who is now head of the dept. of physics.

Dr. Okies received his B.S. degree in biological sciences from The University of Texas at El Paso in 1963. After obtaining his M.D. degree from Baylor College of Medicine in 1967, he was an intern in surgery at Ben Taub General and Methodist Hospitals in Houston.

New Staff

John P. Ricks, III has joined the staff as asst. in medicine, dept. of medicine. Dr. Ricks received his M.D. degree from the University of Mississippi School of Medicine in Jackson. He served his internship at the City of Memphis Hospitals in Tennessee and completed one year of residency training in gynecology at Jeff Davis Hospital, Houston.

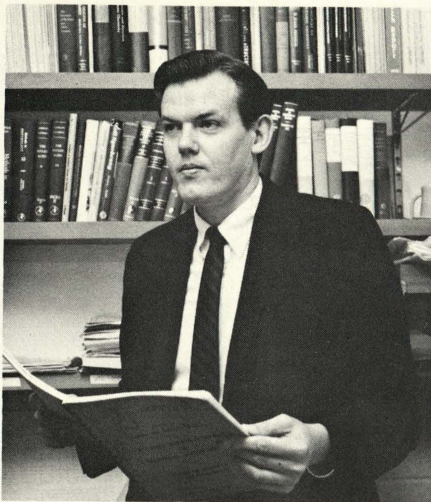
Dr. Ricks will assist in the admissions clinic at MDAH and provide medical coverage at the Anderson-Mayfair, a patient-care hotel owned by The University of Texas. Located adjacent to MDAH, the Anderson-Mayfair provides housing for Anderson patients and their families as well as for distinguished visitors. This facility offers a program for continuous medical and administrative services to residents and thereby augments treatment prescribed by the clinical specialists.

Dr. John E. Curtis has been named asst. internist and asst. prof. of medicine in the dept. of developmental therapeutics. He received the M.D. degree from Dalhousie University in Halifax, Nova Scotia, and served his internship at the Victoria General Hospital in Halifax. Dr. Curtis was a resident and research fellow at Toronto General Hospital. Before joining the staff, Dr. Curtis was project investigator in the dept. of development therapeutics.

Dr. Benjamin Drewinko is now asst. clin. pathologist in the dept. of clin. pathology. He received the M.D. degree from Buenos Aires University of Argentina Medical School and the Ph.D. degree from the Graduate School of Biomedical Sciences of The University of Texas at Houston. Dr. Drewinko served his internship and residency training at Mount Sinai Hospital, New York, and was project investigator in research clin. pathology before joining the staff.

Dr. Ramah La Pushin has been named instructor in biology and instructor in surgery (biology) in the sec. of exper. oncology, dept. of surgery. Her Ph.D. degree was from Cornell University Graduate School of Medical Science where she was a predoctoral fellow from 1964 to 1969. Before joining the staff of MDAH, Dr. La Pushin was associated with the New York Medical School as a postdoctoral fellow.

Mr. Robert S. Sedlacek has been appointed research assoc. in the sec. of exper. radiotherapy, dept. of radiotherapy. Mr. Sedlacek received the M.S. degree from the University of Wyoming and has been associated with MDAH as a research asst. since 1967.



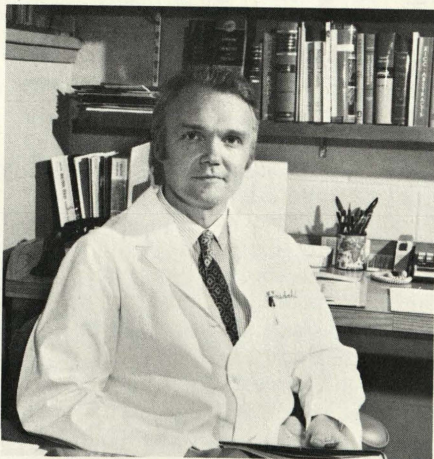
Dr. Roger Hewitt, Chairman of 1971 Symposium.

Surgeon General Will Speak at Symposium

Dr. Jesse Steinfeld, surgeon general, will be the keynote speaker for the Twenty-Fourth Annual Symposium on Fundamental Cancer Research. Dr. Steinfeld's address will be entitled, "Detecting and Eradicating Hazards in Our Environment."

"Environment and Cancer" is the subject of the three-day conference to be held at the Shamrock Hilton on March 3, 4, and 5, 1971. Dr. Roger R. Hewitt, assoc. prof. of biology, is chairman for the symposium. Vice chairman is Dr. Marvin M. Romsdahl, assoc. prof. of surgery.

Co-sponsors of the meeting will be The University of Texas Graduate School of Biomedical Sciences at Houston, The University of Texas School of Public Health at Houston, the Texas Division of the American Cancer Society, and the National Cancer Institute.



Dr. Marvin M. Romsdahl, Co-Chairman of 1971 Symposium.

The objective of the symposium is to identify specific hazards in the environment and to explore the mechanisms of cancer induction. The final session will be concerned with host-dependent factors in environmental carcinogenesis.

Presentation of the twentieth Bertner Foundation and the first Wilson Stuart Stone awards will take place during the meeting.

Sessions will be chaired by outstanding scientists in the field of cancer research: Dr. Samuel Epstein, Children's Cancer Research Foundation, Boston; Dr. Alexander Hollaender, div. of biology, Oak Ridge National Laboratory; Dr. Gerald LePage, dept. of dev. therapeutics at MDAH; Dr. Umberto Saffioti and Dr. John Weisburger, both of the National Cancer Institute.

CLINICAL ABSTRACTS

The editors of the *News Letter* hope to better acquaint practicing physicians with research developments at MDAH by previewing articles of direct relevance to the readers. As they are submitted to various journals for publication, selected articles will be abstracted by members of the MDAH publications department for presentation in the *News Letter*.

The Quality of Success in the Treatment of Cancer Patients: John E. Healey

Statistics released by the Texas Division of Vocational Rehabilitation for 1967-1968 reveal that the cancer patient has a rehabilitation potential comparable to that of other chronic disease patients and therefore should be offered the same rehabilitation opportunities.

Up until the last few years, general pessimism about the survival potential of these patients had stunted efforts to improve by rehabilitative measures the quality of life of the large number of people whose disease is controlled or cured.

Attitudes are now changing as a result of the significant increase in the number of successful battles against cancer. In the past, indigent patients had to be without evidence of metastasis for 18 months before being eligible for prosthetic appliances. Now assistance is available even for immediate postoperative fitting of a prosthesis.

At MDAH, a regional maxillofacial restorative center, headed by Dr. Joe B. Drane, was set up for patients with facial disfigurements caused by surgical removal of head and neck tumors.

MDAH also has restorative programs underway for patients with lymphedema, amputations, speech problems, (Abstracts, Continued on Page 6)

neurological defects, and stomas (tracheal and pharyngeal, ileostomies and colostomies, and ileal conduits).

Dr. Healey believes that rehabilitation is the fourth phase of medicine, after prevention, diagnosis, and definitive treatment. The public must be educated about the rehabilitation potential of cancer patients and the realization that cancer is a group of chronic diseases which can be controlled.

Control of Pain in the Cancer Patient by Subarachnoid Alcohol Block:
William S. Derrick

Subarachnoid alcohol block, used at MDAH for 14 years, appears to be a useful alternative to surgical division of pain pathways in selected patients with advanced cancer. Almost 85% of patients in the series had significant or partial pain relief. Only 2 of 322 had permanent complications. The procedure may be performed by any skilled anesthesiologist or neurosurgeon. Selection of patients includes extremely debilitated patients who are poor candidates for surgery or who refuse surgery.

A 22-gauge, medium bevel, lumbar needle is used to make the subarachnoid puncture. Ordinarily no more than 0.8 ml. of absolute alcohol is injected at any one interspace since larger quantities may produce motor paralysis.

If there is no change in the pain pattern, the block may be repeated after 48 hours. Narcotics should be reduced only gradually. Average duration of pain relief in this series was three to four months.

Complications are rare but may include headache and meningismus, muscle paralysis, bladder or rectal incontinence, and ambulatory difficulties from proprioceptive sensory loss.

Contraindications to subarachnoid alcohol block are tumor involvement of the spinal cord or vertebral column at the interspaces to be blocked, inability of patient to remain in proper position, widespread or poorly localized pain, or minimal pain in an ambulatory patient.

The Radiologic Aspects of Medullary (Solid) Thyroid Carcinoma: Sidney Wallace, C. Stratton Hill, David D. Paulus, Michael L. Ibanez, and R. Lee Clark

Medullary thyroid carcinoma, which represents 10% of all malignant conditions of the thyroid at MDAH, is characterized by increased production of calcitonin, a hormone which acts primarily on bone to suppress resorption and re-

Research Merits Population Foundation Grant

The Population Crisis Foundation of Texas recently awarded Dr. Darrell N. Ward, prof. of biochemistry, and head, dept. of biochemistry, funds for the purchase of laboratory equipment designed to automate the complicated process of determining the amino acid sequence of hormones and to perform comparative studies on hormones from various species at a more rapid rate.

Dr. Ward received the grant specifically to further his research on luteinizing hormone which he began in 1958. This hormone is of interest to the Population Crisis Foundation because it controls ovulation in the female.

Dr. Ward has long been interested in the problem of how hormones control cell function and regards his work as an important subdivision of the general concept of cellular control by biochemical means. His choice of luteinizing hormone as an object of study in 1958 Dr. Ward believes was somewhat fortuitous because of the now widespread interest in population control.

Ovine luteinizing hormone, a very large, protein hormone, consists of two unequal subunits containing several amino acids and carbohydrates in each. A procedure for separation of the two subunits was developed in 1965, and work began in earnest on establishment of the correct amino acid sequence of the hormone. Since the intact hormone

duces release of calcium and phosphorus. This neoplasm is thought to originate from the parafollicular cells of the thyroid and is the only thyroid malignancy which contains amyloid. It is an intermediate grade of malignancy between the favorable papillary and follicular types and the highly malignant anaplastic carcinoma of the thyroid.

The presence of a mass in the thyroid gland is usually the first sign of medullary thyroid carcinoma. Early involvement of the cervical and mediastinal nodes is common. Radiographic detection of calcification in the neck, either in the thyroid gland or in cervical lymph nodes, should suggest the possibility of MTC. Pulmonary metastases are indistinguishable from other primary thyroid malignancies in that the multiple nodular lesions are more or less equal in size and more prominent in the lower lobes. Bone metastases are usually osteolytic.

Diarrhea and peptic ulcers are frequent gastrointestinal complaints associated with this disease, and diarrhea may precede discovery of thyroid lesions by months or even years. Alteration of bowel motility is shown by the rapid

has a molecular weight of 31,000, the ability to separate it into constituent subunits of 15,500 each greatly facilitated this study. Sequencing of subunit A was completed in 1969. It is this subunit that gives luteinizing hormone its characteristic biological activity. The sequencing of subunit S will soon be completed, according to Dr. Ward.

The chemical operation used involves isolation of peptides obtained from specific cleavages within the subunit, selective labeling with radioactive tritium in some instances, and chemical cleavage sequentially between NH_2 -terminal amino acids by the Edman degradation. Formerly, this lengthy procedure, involving as many as 70 steps for one sequencing, was done by hand. Now, a mechanical sequencer is programmed to perform all steps in breaking down the molecule, leaving only the final chromatographic analysis for identification of the residues removed to the technician.

After determination of subunit S structure, Dr. Ward plans to make a comparison of luteinizing hormones isolated from cattle, pigs, human beings, and other species in an effort to discover how hormones interact with normal cells, what they have in common to achieve their specific effects, and wherein they may differ.

transit time of barium meal through the gastrointestinal tract in a high percentage of patients as well as members of their families.

Pheochromocytoma, parathyroid adenomata or hyperplasia, and mucocutaneous neuromata are at times found in association with MTC. The familial variety of the MTC pheochromocytoma is frequently bilateral. Calcification in a suprarenal mass should suggest the possibility of pheochromocytoma. Further radiographic investigation is done by adrenal venography, aortography, and selective arteriography.

14th Year Book of Cancer Published

The fourteenth in the annual series of the *Year Book of Cancer* (1970) is now available from Year Book Medical Publishers, Inc., 35 East Wacker Drive, Chicago, Illinois 60601, at a cost of \$14.00.

Editors of this series of volumes are Dr. R. Lee Clark, MDAH President, and Dr. R. W. Cumley, editor and head of the dept. of publications.