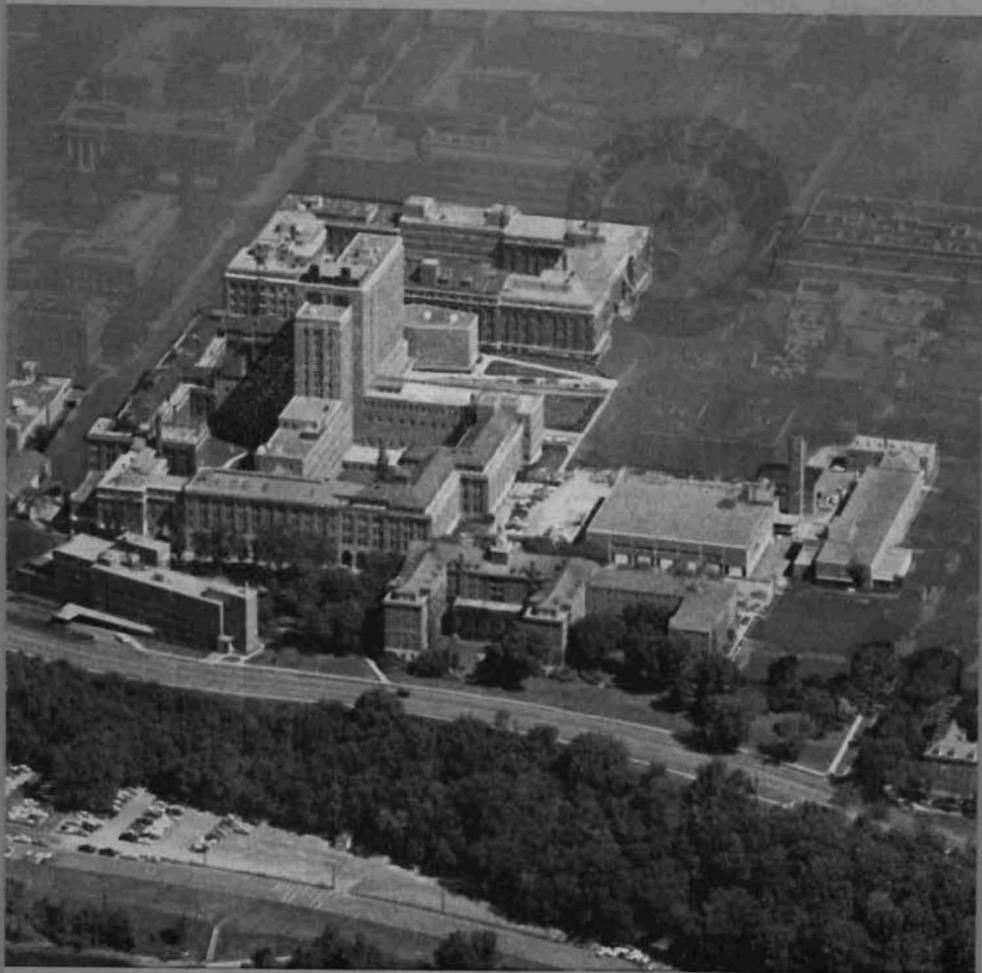


University of Minnesota
MEDICAL BULLETIN



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INTRODUCTION

The revised curriculum in the junior and senior years at the Medical School includes an opportunity for senior students to spend three months as an "elective." This period is spent at the University of Minnesota in some special program of the student's choosing, or at another accredited medical school in this country or abroad.

In the summer of 1962, Daniel J. Ulyot, a medical student in the 1963 graduating class, spent his elective as a medical exchange student at the Welsh National Medical School in Cardiff, Wales. During this period, he was integrated into the routine of a British medical school, and had the opportunity to live as a British medical student.

Mr. Ulyot's experiences are recorded on the following pages for the Medical Bulletin.

— W.A.S.

Special Article

An American Medical Student in Britain*

DANIEL J. ULLYOT†

A leaden, late afternoon sky greeted me on my arrival in Cardiff. The buildings of the city were enshrouded in a heavy mantle of haze and although it was midsummer the air had a penetrating chill. "Pretty dreary place," I thought, as I stood on the station platform. A jovial English accent interrupted my thoughts. "Hello, my name is Scott Blewett. Let me have a go with those bags of yours." Presently we were tearing along in Scott's red MG toward my new home for the next three months. Later that evening, after my first taste of British cuisine (bacon and egg pie, fresh garden peas, tea and biscuits), several of the students and I were busily getting acquainted in one of those delightful country pubs so given to quiet conversation and relaxed conviviality. The conversation revolved about American politics, English rugby, and, incidentally, what I might expect on my first confrontation with the British medical world.

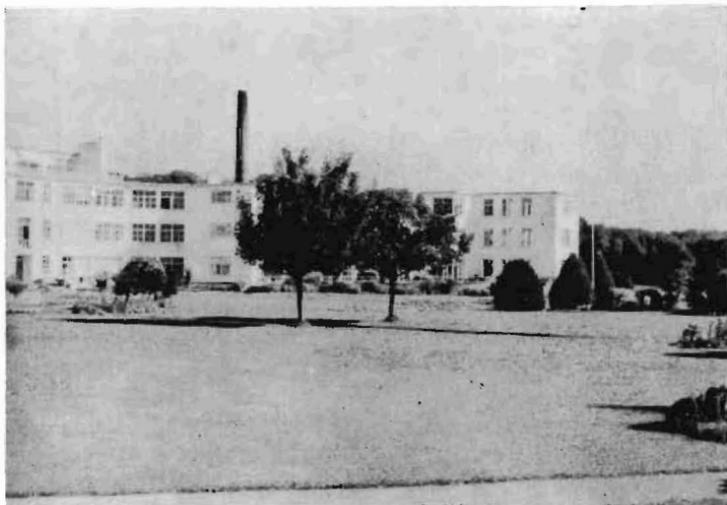
I was given a spacious room in one of the student hostels about two blocks from the Cardiff Royal Infirmary, the teaching center of the Welsh National Medical School. Meals were served at the nearby students' club, as was morning and afternoon tea. It was agreed that I should spend my first month on the medicine service followed by a month on surgery, and finally a month devoted to interests of my own choosing.

* *Written especially for the University of Minnesota Medical Bulletin*

† *Member of the Class of 1963, University of Minnesota Medical School*

Five of us were assigned to Professor Scarborough's "medical unit," which consisted of a men's ward of 20 beds and a women's ward of about equal size. As students we worked up patients on the unit and attended daily teaching rounds with members of the staff. We were expected to perform a careful history and meticulous physical on our patients and to keep a written record of our work in individual notebooks which we carried with us on the ward. Routine lab work was not required of us, but not infrequently we found ourselves performing several determinations on a patient whose condition was changing rapidly and reporting the results directly to the consultant. Our written workups were gone over carefully on an individual basis with members of the staff.

Perhaps the most memorable part of my experience in Cardiff was the daily bedside-teaching rounds with the Professor or one of his consultants. These rounds were



View of Sully Hospital, Cardiff, Wales. Formerly a tuberculosis sanatorium, it is now a center for thoracic diseases. Spacious grounds, well-kept gardens, hedges, and trees are typically British.

lively, stimulating, occasionally agonizing. The exercise was conducted by the Professor, who probes with deft precision (and frequently with a finely sharpened needle) to make a point or to expose a weak spot in the student's approach or method. "Mr. Ulyot will now demonstrate the examination of the abdomen—you will notice that he commits the error of most beginners in palpating excessively with the tips of his fingers." "Mr. Jones, I read in your clinical notes 'no serious illnesses'. Tell me, do you consider a sore throat a serious illness?"

The emphasis is on competence in eliciting an informative history and in performing a skillful physical examination. Great stress is placed on observation. One consultant told us, "I don't care a damn whether one of you can tell me the 20 causes of splenomegaly. The good man is the one who can make *important* observations. Do you read Dickens? It is the easiest thing on earth to make diagnoses from his observations and lucid descriptions." Another said, "Seventy-five percent of the time the diagnosis is obvious. The remainder of the time the physician is called on to make *discoveries* which will render the diagnosis clear. These are the unheralded *discoveries* which are a part of the day-to-day enterprise of the clinician. Occasionally he will make a discovery of more universal significance. That chap who related birth deformities to the taking of Thalidomide really had his eyes open." And so it went. The student was entreated to squeeze every possible bit of information from the clinical confrontation with his patient.

The high level of clinical excellence at Cardiff was impressive. Part of this is due to the comparative dearth of laboratory facilities which forces them to a greater dependence on their clinical observations. (The British lag behind us a good 10 years in physical facilities, especially in well appointed labs). Most of the consultants (staffmen) and registrars (residents) do not engage in research. To be sure they keep well abreast of the literature, but they are essentially teachers and practitioners of clinical medicine. They are judged by their care of patients rather than by the number of scientific publications to their credit.

Accordingly, the students' curriculum stresses the development of clinical skills. The first year of medical school is spent learning various pre-medical subjects. The second year is devoted entirely to anatomy and physiology. The remaining four years are spent on the wards learning medicine, surgery, midwifery, and pediatrics. It is during the third and fourth years, in addition to his work on the wards, that the student studies pathology, bacteriology, therapeutics, and forensic medicine. To qualify for the M.B. (Bachelor of Medicine) the student must pass both a written exam and a clinical exam at the end of his sixth year in each of the four clinical subjects. The clinical examination consists of one long case and several short cases in which the student is observed individually at the bedside.

The British student enjoys more freedom than his American counterpart. He is not nearly so much a member of the "team" in the management of patients. (However, he has the opportunity to take a "locum" in his fifth and sixth years in which he acts as an intern while the latter is on holiday.) He is not expected to participate in working rounds with the house staff. There are few formal conferences. The pace is leisurely and far less competitive than our own. There are few opportunities for research. Much more time is spent on extra-curricular pursuits. Remembering that the British student enters his medical course directly after grammar school, it is difficult to escape the observation that medical education in Britain must fulfill broader educational goals than ours. Many of the maturing intellectual and social experiences Americans acquire in college are per force part of the medical school experience in Britain. It is equally inescapable, however, that much of our competitiveness and compulsiveness in medical school is really unnecessary and that learning can proceed without the grim, exhausting struggle which has come to be associated with "dedication" and achievement in our schools.

The students at Cardiff are a militantly individualistic lot representing all parts of Britain as well as many of the Commonwealth countries. Almost all are on government scholarship. Many are sons of coal miners. Women make

up one-third of the class. The president of the fifth year class is a Scotsman. The captain of the soccer team is from Kenya. The students are very sports-minded and everyone, no matter how incoordinated, plays a sport. (They seem to have the curious idea that sport is for the pleasure of the participant rather than for the entertainment of the spectator.) They have well formulated opinions about America and Americans derived in large part, I believe, from the great number of Hollywood films seen in Britain. Under the incessant barrage of stimulating and provocative questions I discovered how others see us, and was greatly motivated to learn more about my own country.

As a midwesterner, I found the health problem of a heavily industrialized area to be immensely interesting. South Wales is an important coal mining community and coal miners' pneumoconiosis as well as other chronic lung diseases, are rife. Professor Gough, a distinguished British pathologist, has developed a full section technique for the study of pulmonary disease, and the opportunity to observe his work was a singular one for me. Along with the abundant clinical and pathological material available I had the exciting experience of visiting the coal mines and witnessing first hand the conditions which produce these problems. I shall never forget my first descent deep into the recesses of the earth where we crawled on our hands and knees along narrow tunnels which in places were scarcely three feet in height. As I watched the colliers, bare to the waist, urgently harvesting the glistening black coal amid what seemed an intolerably sooty atmosphere, I thought what a tremendous human price we pay (often taken for granted) to maintain our industrial machine. I came away convinced that I should not like to earn my livelihood as a coal miner. At the same time I felt a curious fascination and respect for these people who are so lighthearted, resourceful, and courageous, despite (or perhaps because of) their arduous and oppressive daily existence.

I cannot begin to elaborate on the many interesting experiences which befell me in Britain. The visits to the miners' homes in the Rhondda Valley; the epidemiological case finding in the wake of the recent smallpox epidemic

in Wales; the days with Dr. Copp, an exceedingly skilled and dogged general practitioner; the visits to the Pneumococcal Research Center in Llandough—all highly instructive experiences.

My three months in Britain provided the invaluable opportunity to know a system of medical education in many ways sharply contrasting with our own. I think it can be said fairly that we produce a better informed medical graduate, surely one with more theoretical sophistication. It is less clear that we produce a better physician. The difference in living standards vitiates the comparison be-



View of a coal-mining village in Rhondda Vale, South Wales. Miners live in rows of connected houses built by mine developers, adjoining the pithead, the pub, and the chapel. The village is constantly reminded of its *raison d'être* by the coal tip (accumulation of discarded washings) looming in the background.

cause our methods and approach would have little applicability in parts of Britain for obvious economic reasons. Educational goals must be in accord with the realities of the society which is served, and to compare the merits of one system by the standards of the other can be foolhardy. Overall, the similarities between the two systems are more striking than the differences.

My Cardiff days succeeded in converting me into an ardent Anglophile. The pleasure of working with colleagues in Britain is one which I shall not soon forget.



The author after a tour underground in the Nantgarw Colliery, South Wales. The powerstation and mine shaft entrance are visible in the background. Nantgarw is a modern colliery, considered a "showplace" by the British National Coal Board.

Staff Meeting Report

A Search for Subtle Neurotropicity of an Attenuated Live Measles Virus Vaccine*

J. W. ST. GEME, JR., M.D.†

F. S. WRIGHT, M.D.‡

F. JONESϕ

F. HALBERG, M.D.††

J. A. ANDERSON, M.D., PH.D.‡‡

Live modified measles virus vaccine has proved effective both antigenically, leading to an approximate 97% rate of seroconversion, as well as prophylactically, reportedly providing 100% protection. In our hands, its administration was not associated with subtle neurophysiologic dysfunction or dissemination of virus to the central nervous system.

This study was prompted by the serious, though rare (1:1000), encephalitic sequelae of natural measles. In the way of background, Enders and associates, while preparing the vaccine, had ascertained that attenuated measles virus does not multiply in the simian brain following intracerebral inoculation. In other clinics, children immunized with this vaccine have shown thus far neither overt encephalopathy nor an alteration of routine electroencephalograms. Against this background was designed a multifaceted search for viral neurotropicity.

Data requirements for some of the techniques proposed for this study necessitated the choice of a small group of children, in lieu of an approach with more restricted sampling on a larger population.

* Presented at the Staff Meeting of University Hospitals on March 22, 1963

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†† Professor of Experimental Pathology, Department of Pathology

‡‡ Professor and Head, Department of Pediatrics

METHODS. Ten severely retarded female children from the Cambridge State School and Hospital were selected from a larger mixed population by serologic screening for the absence of measles neutralizing antibody. Two of the children were found to be seropositive by further neutralizing antibody assay with undiluted serum. By random distribution, two groups were formed, each composed of four susceptibles and one immune, with a mean age of 9.4 years. The two groups were formed so that a double-blind crossover design, using vaccine and placebo, could be employed in the study. Subjects received either 0.5 ml. of Lederle vaccine I.M. (Enders' vaccine A-derived, 10^4 TCID₅₀/ml.) or 0.5 ml. of Lederle placebo I.M. (cell culture control). Later, the groups were reversed, the placebo group receiving vaccine, and the vaccine group receiving placebo.

Host rectal temperature was recorded every six hours for four consecutive 30-day periods; pre-inoculation, post-vaccine inoculation, post-placebo inoculation, and late post-inoculation. Spectral analysis of temperature was performed, apart from inspection of records for fever, in order to gauge possible subtle neurotropicity as it might be revealed by the persistent alteration of temperature rhythm beyond the febrile period. By electronic computer-techniques a numerical estimate of the contribution of circadian rhythm to total temperature variation — the circadian quotient (CQ) — was obtained for each subject for each of the four study periods.

Electroencephalograms were recorded for six-minute periods at three-hour intervals for 24 hours on day 5 pre-inoculation, day 9 post-inoculation, and day 16 post-inoculation. Electroencephalograms were obtained with a Grass instrument and, while recording, the central-occipital channel was evaluated with an Offner Frequency Analyzer. The electrical output in the delta band (1.5-3.5 cycles/second) was quantified from the records of the frequency-analyzed channel by measurement of the height of pips (in cm.). The delta band was selected for subsequent statistical analysis since with clinical encephalitis a slow-wave, high-voltage shift is often present in routine electroencephalograms and since a similar transient shift has been detected in about 50% of cases of uncomplicated natural measles.

On the day of vaccine or placebo inoculation and on day 10-11 post-inoculation cerebrospinal fluid (CSF) — and blood — was removed for determination of pleocytosis, protein content, and the ratio of CSF/serum glutamic-oxalacetic transaminase. This aspect of the study was prompted by the cellular and biochemical changes in CSF and possibly altered blood-brain barrier associated with encephalitis.

CSF and simultaneous whole blood specimens, obtained on day 10-11 post-vaccination, were inoculated into primary monolayer cultures of rhesus monkey kidney cells in order to detect measles vaccine virus. Pre-study and post-study paired sera were assayed for measles virus neutralizing antibody.

RESULTS. A three to four day febrile period began in all non-immune subjects about seven days after inoculation with vaccine but not after placebo. Almost simultaneously a morbilliform rash, lasting approximately one week, appeared in three of the eight susceptible children.

The circadian temperature rhythm revealed no gross abnormality. A transient depression of the CQ occurred in all but one of the non-immune subjects during the post-vaccine inoculation period and returned to normal during the late post-inoculation period. These transient depressions of the CQ could be attributed to the febrile episodes occurring during the vaccination period. There was no evidence for persistent disturbance of temperature rhythm.

No significant alteration of total delta band electrical output, as quantified with a frequency analyzer, was detected after vaccine administration.

Study of the CSF revealed no pleocytosis, significant elevation of protein, or change in either glutamic-oxalacetic transaminase content or ratio to serum during the phase of rash and fever.

Maintenance of inocula by blind passage in monkey kidney cell cultures failed to yield attenuated measles virus from CSF or blood specimens.

Neutralizing antibody response ($>1:8$) occurred in the eight non-immune subjects. A booster response in the two immune subjects was not observed.

Extensive quantitative study of a small group of institutionalized children thus failed to provide any evidence for

even subtle neurotropicity of a commercial modified live measles virus vaccine. Without extrapolating beyond the scope of this limited number of subjects, these observations should further more liberal acceptance of a vaccine which could conceivably eradicate a serious childhood disease.

Staff Meeting Report

Relationship of the Mumps Skin Test to Endocardial Fibroelastosis*

GEORGE R. NOREN, M.D.†

PAUL ADAMS, JR., M.D.‡

RAY C. ANDERSON, M.D.ϕ

The unpublished observation of D. L. Thurston, M.D., St. Louis Children's Hospital, St. Louis, Missouri, concerning the presence of a positive skin reaction to mumps antigen in an infant with endocardial fibroelastosis prompted the present study.

The response of skin reactivity of 0.1 ml. of mumps skin antigen (Lilly) injected intradermally was measured in 49 infants and children, 47 of whom were under 2½ years of age. None of the children presented a history of having had mumps. The group was composed of 26 children without evidence of heart disease and 23 children with a diagnosis of congenital or acquired heart disease. The children with heart disease included five with interventricular septal defect (with or without patent ductus arteriosus), two with aortic stenosis, two with patent ductus arteriosus, two with coarctation of the aorta, one with pulmonary atresia, one with idiopathic myocarditis, one with glycogen storage dis-

* Presented at the Staff Meeting of University Hospitals on March 22, 1963.

† Trainee, Cardiovascular Research Program, Department of Pediatrics

‡ Associate Professor, Department of Pediatrics

ϕ Associate Professor, Department of Pediatrics

ease of the heart, and nine with endocardial fibroelastosis.

The criteria for establishing the diagnosis of endocardial fibroelastosis consisted of the presence of cardiac failure at an early age, enlargement of the heart as demonstrated by physical and roentgenographic findings, presence of left ventricular hypertrophy and strain pattern on the electrocardiogram, and the presence of left ventricular hypertrophy by vector-electrocardiography. Cardiac murmurs when present were typical of aortic or mitral valve involvement. Cardiac catheterization findings supported the diagnosis in five of the children, and in the one child who died the diagnosis was confirmed at necropsy.

All of the children with a diagnosis of endocardial fibroelastosis demonstrated an erythematous reaction of 10 mm. or greater at the site of the mumps antigen inoculation. We have considered a positive skin reaction to the mumps antigen to be the occurrence of an erythematous reaction 10 mm. or greater in diameter 24 to 36 hours after inoculation. One of the children with a diagnosis of interventricular septal defect in whom an associated diagnosis of endocardial fibroelastosis has so far been excluded also had a positive reaction. This child's mother gave a history of having had mumps in the first trimester. None of the children with other heart problems or the control children demonstrated more than 4 mm. of erythema at 24 to 36 hours. The mothers of two of the children with endocardial fibroelastosis presented a definite history of exposure. One mother had mumps during the first month of pregnancy. Histoplasmosis, coccidiomycosis, and blastomycosis skin tests injected intradermally into six of the nine children with endocardial fibroelastosis showed negative reactions.

Skin reactivity to killed mumps virus has been defined as evidence of previous mumps infection whether or not a history of mumps infection is present. It has been demonstrated that skin reactivity remains in the absence of complement fixing antibodies. It has also been suggested that children under the age of 18 present lesser degrees of skin reactivity following mumps infection than do adults even when comparable complement fixing antibodies are present.

The presence of a significant reaction of the skin to mumps antigen in all of the children with a diagnosis of endocardial fibroelastosis and the history of a definite exposure to mumps in two of the mothers and the presence of mumps infection in one of the nine mothers during pregnancy suggest the possibility that intrauterine infection with the mumps virus in the first trimester of pregnancy may be involved in the etiology of some cases of endocardial fibroelastosis.

The possibility that heightened skin sensitivity to agents other than the mumps antigen in the preparation used in these cases cannot be excluded at present. Further studies are in progress to define more precisely the significance of these preliminary findings.

Staff Meeting Report

Radioactive Isotope Scintiscanning*

MERLE K. LOKEN, PH.D., M.D.†

Visualization of radioisotopes localized in various parts of the body has become an important aspect of nuclear medicine. Radioisotopes of interest in this regard are those which are selectively taken up by certain organs and/or tissues of interest, and emit radiations (usually gamma rays) which can be detected by a Geiger or scintillation counter. The differential isotopic uptake is usually viewed from a recording of the radioactivity as detected by a scintillation crystal as it scans the area of interest.

In most scanning situations, the uptake differential between target and non-target tissues is relatively low. Thus

*Presented at the Staff Meeting of the University Hospitals on March 29, 1963

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maximum use must be made of the sensitivity and resolution of detector, analyzer and recorder systems in order to minimize the amount of administered radioactive material and still achieve meaningful information from the scan. The principles of focused collimation, gamma ray spectrometry and photorecording are conventionally used. A focused collimator permits a point-to-point relationship to be established between the area being scanned and its recording. The gamma ray spectrometer with its associated circuitry permits selected reception of electrical impulses produced by radiation coming from the target area while discriminating against those impulses resulting from background radiation. By means of the photorecorder, the electrical impulses passing the spectrometer activate a light that moves in parallel with the detector. This light exposes x-ray film as it moves back and forth. The intensity of the light and consequently the blackening of the x-ray film is directly proportional to the radioactivity beneath the scintillation counter.

Scanning may be done to advantage with the differential uptake by the target tissues being either greater or less than surrounding non-target tissues. Results are generally better when the uptake is greater in the target tissues, since it is easier to detect a small volume of tissue with localized radioactivity than it is to find a volume of similar size that localizes radioactivity less well than surrounding tissues.

Due to a relatively high difference in radioiodine uptake between target and non-target tissue, the thyroid lends itself particularly well to scanning techniques and was the first organ studied by this procedure. Information as to size, shape and location of the thyroid may be gained from scanning. The results of thyroid scanning may be of help in deciding whether or not a palpable nodule in the thyroid is likely to be benign or to be malignant. Not more than 10 percent of malignant nodules concentrate iodine to any significant degree. A nodule within the thyroid which shows greater activity in the surrounding tissue is almost certainly benign. A "cold" nodule, on the other hand, has much less diagnostic value because it may be malignant, or even more likely it may be an area of inactive or degenerated

thyroid tissue, an inactive thyroid cyst or a mass of inactive colloid.

Isotope scanning is helpful in diagnosing liver disease, particularly in situations where the patient is suspected of having metastatic nodules in the liver. Two isotopes being used in our laboratories for liver scanning are I^{131} and colloidal gold Au^{198} . The radioiodine tagged to rose bengal is picked up by the parenchymal cells of the liver and then excreted into the duodenum. Radioactive colloidal gold particles are concentrated in the reticuloendothelial cells of the liver. Tumors, abscesses and cysts of the liver are not likely to take up either of these materials and may thus be outlined. Congenital or acquired malposition of the liver and certain abdominal masses may be identified by this scanning technique.

The greatest emphasis in scanning during the past several months has been directed toward the diagnosis of brain tumors. Initially we used radioactive iodinated human serum albumin (RISA) which is reasonably well concentrated in the more vascular brain tumors. More recently we have been using neohydrin tagged with mercury- 203 which holds promise of achieving a place in the evaluation of brain tumors equal to that of angiography and pneumoencephalography. We have had our best success in detecting glioblastomas. Meningiomas and metastatic tumors have been localized with good success using two orthogonal scanning planes. Likewise, cerebral abscesses and subdural hematomas have been detected. It is expected that our over-all success in localizing expanding lesions (both malignant and benign) is over 75 percent. Occasionally this scanning method has demonstrated the presence of a brain tumor when other diagnostic techniques have failed and thus seems to be meeting an important need as a screening procedure.

Kidney scanning has thus far met with only fair success. The major difficulty has been the lack of selective localization in these organs. Scans have been made using Hg^{203} neohydrin which localizes in the kidneys, but unfortunately is also found in the liver. This makes visualization of the right kidney particularly difficult because of its anatomic relation to the liver. Hippuric acid tagged with I^{131} has also

been used for kidney scans. It must be continuously infused during the scan because of its rapid excretion.

Techniques for scanning spleen, pancreas and bone are presently being worked out. Splenic visualization is based on the ability of the spleen to concentrate Hg^{203} -neohydrin, or chromium⁵¹ tagged erythrocytes which have been damaged by heating. The neohydrin is taken up by the reticulo-endothelial cells of the spleen and the interpretation of the scan requires a knowledge of the liver pattern. For the latter technique, ten milliliters of the patient's erythrocytes are labeled with chromium⁵¹ and then heated under controlled conditions so that upon readministration the tagged cells are phagocytized by the spleen.

To date, no technique other than laparotomy has been devised for satisfactorily visualizing the pancreas. At present we are attempting to scan the pancreas following the administration of a radioactive amino acid formed by replacing the sulfur atom in methionine with selenium⁷⁵. Results to date are encouraging with gross lesions of the pancreas having been demonstrated.

The Future

Despite its infancy status, isotope scanning is a recognized diagnostic procedure in medical practice. Synthesis of new radiopharmaceutical compounds that may be selectively localized in the body, together with advances in instrumentation for scanning, will continue to expand the horizons of nuclear medicine. Already a prototype of a pin-hole scintillation camera has been built which views selected portions of the patient's body with a battery of miniaturized detectors, amplifiers and recorders. This system is expected to make the moving probe scanner obsolete within the next few years because it will permit almost instantaneous scans to be made.

Staff Meeting Report

Lactic Dehydrogenase of the Lens*

W. L. FOWLKS, Ph.D.†

RAYMOND E. GINGRICH, M.D.‡

ROBERT B. ELDRIDGEϕ

Ten years ago Pirie, van Heyningen and Boag, in a paper concerned with changes in the lens formation of X-ray induced cataract, reported the results of their analysis of lactic dehydrogenase activity of rabbit lens homogenates. This is apparently the first report of the actual presence of this enzyme in the lens although it had been known for a number of years before 1953 that the lens metabolized glucose with the production of lactate which presumably would require the presence of the lactic dehydrogenase enzyme. Wortman and Becker confirmed Pirie's report in 1956 using the pyruvate-NADH assay method. Two years later Kuhlman and Resnisk reported that in the rat lens LDH activity is highest in the capsule and cortex and lowest in the nucleus.

Work on the isolation of lactic dehydrogenase from the lens began in our laboratories two years ago. By the use of ammonium sulfate fractionation methods a crystalline protein with lactic dehydrogenase activity was isolated from bovine rabbit and dog lenses.

In the simplified procedure which has given us the best results in the isolation of bovine lens LDH there are four steps. First the decapsulated lenses are homogenized with 10 volumes of 0.2 M phosphate buffer pH 7.3. Second, sufficient saturated ammonium sulfate solution is added slowly to bring its concentration to 1.6-1.7 M in the mixture. After stirring an hour the mixture is then centrifuged. Ammonium sulfate concentration in the resulting solution is

* Presented at the Staff Meeting of University Hospitals on April 5, 1963.

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‡ Assistant Professor, Department of Ophthalmology.

ϕ Laboratory Technician, Department of Ophthalmology.

then increased to 2.6 M and the precipitate which forms is collected. Crystallization of this fraction (the 1.7-2.6 M precipitate) was accomplished by taking the precipitate up in a small volume of 2.0 M ammonium sulfate adding sufficient saturated ammonium sulfate solution to bring the concentration to 2.25 M, centrifuging, then increasing the concentration of ammonium sulfate to 2.45 M. The lactic dehydrogenase activity crystallizes out overnight. After 3 such crystallizations the specific activity was not appreciably increased by further crystallization. Essentially similar results have been obtained with rabbit and dog lenses.

The lactic dehydrogenase from bovine lens does not crystallize in the same form as the LDH of ox heart. The crystalline material we have obtained appears as microcubes or squares, which tend to aggregate, rather than in the tapered needle form obtained with the bovine heart enzyme.

Chemical Properties of the Enzyme

Recrystallized bovine and rabbit lens LDH catalyse the reduction of pyruvate in the presence of NADH at pH 7.4 and the oxidation of lactate in the presence of NAD at pH 9.6. A maximum rate at 22° for the lactate to pyruvate reaction was found at pH 9.0-9.2. There was no detectable oxidation of NADPH when it was substituted for NADH.

The LDH activity of these preparations is not altered by preincubation at room temperature for 30 minutes in 10^{-3} M solutions of the following metal complexing agents: cyanide, 1, 10-phenanthroline, 8-hydroxyquinoline, diethyldithiocarbamate and ethylene-diaminetetracetic acid (EDTA). However, we noted that if EDTA was added to the buffer during the initial homogenization of bovine lens the LDH finally obtained was not as stable as the usual preparations. Crystalline rabbit and bovine lens LDH preparations which were kept at 4° in 2.6 M ammonium sulfate for periods up to 2 years lost little of their original activity.

Preincubation of bovine or rabbit lens LDH with N-ethyl maleimide, 2×10^{-3} M in phosphate buffer, pH 6.8, for period up to 60 minutes gave no inactivation of the enzyme, nor was there a decrease in optical density at 300 mu. It thus

appears that lens LDH has no SH groups available to react with N-ethyl maleimide.

Mercury salts react very slowly with bovine lens LDH but after incubation for 16 hours at 4° with excess mercury ion all the LDH activity was restored by addition of sufficient diethyldithiocarbamate to complex the mercury. Lead salts have no effect.

Lactic dehydrogenase from rabbit and bovine lenses is inactive in the presence of borate buffer, pH 9.6-10. Bovine LDH is competitively inhibited by oxamate, 2.5×10^{-3} oxamate giving half normal velocity of lactate oxidation under standard assay conditions.

Column Chromatography of Lens Lactic Dehydrogenase

The protein, typically 75-100 mg, was added to a 2.5 x 13 cm DEAE cellulose column after dialysis against 0.001 M PO_4 buffer. It was washed in with 50 ml 0.005 M PO_4 buffer and then the eluate was changed to 0.05 M PO_4 buffer containing enough NaCl to make the solution 0.1 M in chloride. Chromatography was run at room temperature, 21°-22° C, and 1.5 ml fractions were collected. A typical chromatogram had two peaks of enzyme activity and two corresponding peaks of protein. Chromatograms run successively from the same enzyme preparation would have peaks of protein and enzyme activities at identical elution volumes but whereas most of the enzymes and protein would be in the first peak for one run it might appear in the second peak on the other run. Rerun of protein from one peak again gave two peaks.

Physical Chemical Studies

Preliminary studies in the analytical ultracentrifuge using both the sedimentation velocity and sedimentation equilibrium methods gave no indication of a multiplicity of proteins. The proteins examined were recrystallized from the peak tubes of the 1st and also of the second peaks from the DEAE cellulose column chromatograms of bovine LDH. Using data from these runs an estimate of the mean molecular weight of bovine LDH was obtained. This gave a probable value of 60,000 - 75,000 for the mean molecular weight or approximately one-half of the generally accepted value for LDH isozymes obtained from other tissues.

Paper electrophoresis of 4 X recrystallized rabbit lens LDH gave only one line. Microelectrophoresis of whole lens homogenates on agar gel coated slides gave only one band with LDH activity. Only one band with LDH activity was found when the crystallized bovine lens LDH was similarly run. In these runs at pH 8.2-8.3 LDH activity moved from the origin toward the negative electrode.

In none of the studies of lens antigens has the enzymatic properties been examined of any of the antigens of the lens. Since an apparently homogeneous lactic dehydrogenase from beef lens was already available in our laboratory, an investigation of its immuno-chemical properties was begun.

Commercially obtained 8 lb. albino rabbits were immunized with carefully cleaned, pooled dog lenses. The Schneidegger modification of the standard immunoelectrophoretic technique was used. After electrophoresis, the anti-dog lens antibody was added and the slides were incubated for 24 hours, washed in buffer 5 days, dried and stained for permanent recording and photography.

When column purified LDH from *dog* lens was run by the immunoelectrophoresis technique against our anti-dog lens serum only one arc was obtained, a slow component which localizes in the γ -crystallin area.

When the purified *bovine* lens protein was run in the same manner against anti-*dog* lens serum again only one arc was obtained. This pattern held true for the rabbit lens protein as well.

Both immunoelectrophoretic identity reactions, by the method of Wadsworth and Hanson, and Ouchterlony identity reactions were positive, thus showing immunologic identity between the materials isolated from all three sources.

This single arc was only one of 6-8 cross-reacting antigens found when whole beef and rabbit lenses were run against anti-dog serum. This line in the whole lens homogenate disappeared when antiserum adsorbed against lens LDH from any of our sources was used.

The lactic dehydrogenase activity on the agar slides ap-

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peared concentric both with the purified LDH arc and the specific line in the whole lens homogenate identified as the LDH antigen.

From these studies, therefore, it appears that a homogeneous protein which also contains the LDH activity has been obtained from the lens. This is also an organ specific antigen in certain mammalian lenses and seems to be identical both immunologically and physico-chemically in those species tested.



Special Article

The Tradition of Respectful Argument*

THE RT. REV. MSGR. JAMES P. SHANNON †

One mark of an educated man is his ability to differ without becoming angry, sarcastic, or discourteous. Such a man recognizes that in contingent matters there will always be a place for legitimate difference of opinion.

He knows that he is not infallible, he respects the honesty and the intellectual integrity of other men, and presumes that all men are men of integrity until they are proved to be otherwise. He is prepared to listen to them when their superior wisdom has something of value to teach him. He is slow to anger and always confident that truth can defend itself and state its own case without specious arguments, emotional displays, or personal pressures.

This is not to say that he abandons his positions easily. If his be a disciplined mind, he does not lightly forsake the intellectual ground he has won at great cost. He yields only to evidence, proof, or demonstration. He expects his adversary to show conclusively the superior value of his opinions and he is not convinced by anything less than this. He is not intimidated by shouting. He is not impressed by verbosity. He is not overwhelmed by force or numbers.

His abiding respect for truth's viability enables him to maintain composure and balance in the face of impressive odds. And his respect for the person and the intellect of his opponents dissuades him from using cheap tricks, caustic comments, or personal attacks against his adversaries, no matter how brilliant or forceful, unjust or unfair, they may be. Because of his large views of truth and of indi-

* Reprinted from the *College of St. Thomas newspaper*, THE AQUIN, March 17, 1962

† President, *College of St. Thomas, St. Paul, Minn.*

vidual human responsibility, he is prepared to suffer apparent defeat in the mind of the masses on occasions when he knows his position is right. He is not shattered by this apparent triumph of darkness, because he realizes that the mass-mind is fickle at best.

He is neither angered nor shocked by new evidence of public vulgarity or blindness. He is rather prepared to see in these expected human weaknesses compelling reason for more compassion, better rhetoric, and stronger evidence on his part. He seeks always to persuade and seldom to denounce.

The ability to defend one's own position with spirit and conviction, to evaluate accurately the conflicting opinions of others, and to retain one's confidence in the ultimate power of truth to carry its own weight are necessary talents in any society but especially so in our democratic culture.

To lack firm conviction is to be rootless. To lack respect for the differing position of others is to be haughty or ignorant or both. And, to lack conviction of the power of truth to state its own case is to be unworthy of intellectual combat. Men who lack one or all of these talents reveal clearly in public and private discussion the limitations of their education and the extent of their personal insecurity.

There is some evidence that these virtues are in short supply in our day in our land. The venerable tradition of respectful argumentation, based on evidence, conducted with courtesy, and leading to greater exposition of truth is a precious part of our heritage in this land of freedom. It is the duty of educated men to understand, appreciate, and perpetuate this tradition.

Medical School News

RAY AMBERG HONORED AT RECOGNITION DINNER

Ray M. Amberg, director of the University of Minnesota Hospitals for the past 28 years, was honored March 27th at a Recognition Dinner sponsored by the Minnesota Medi-



cal Foundation and attended by more than 400 friends and colleagues at Coffman Memorial Union, University of Minnesota.

The 67-year-old administrator received the Distinguished Service Award of the Minnesota Medical Foundation from Dr. Corrin H. Hodgson, president. He also accepted a Distinguished Service Director Award from the Board of Regents,

presented by Dr. O. Meredith Wilson, University of Minnesota president. Gerald T. Mullin, his long time friend and president of the Minneapolis Gas company, served as master of ceremonies.

Dr. Hodgson said the Board of Trustees of the Foundation nominated Mr. Amberg to be the 4th recipient of its Distinguished Service Award in recognition of his "exceptional devotion to the ongoing welfare of the University Hospitals, the College of Medical Sciences, the University of Minnesota, and the people of Minnesota." His citation was accompanied by a cash prize provided by the special gifts of friends.

A highlight of Mr. Amberg's notable career has been his liaison work with the Minnesota State Legislature, an assignment he undertook 36 years ago under the adminis-

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tration of the late University president, Lotus D. Coffman. His skilled management of the University Hospitals has helped gain national and international acclaim for the University's medical science departments, and has built the 775-bed University Hospitals into one of the world's great medical centers.

Mr. Amberg served as president of the American Hospital Association in 1958-59, and has long shared in its state and national leadership. He is a past president of the Minnesota Tuberculosis and Health Association, and was chairman of the Minnesota Hospital Construction Program, 1945-62. In 1953 he received the Minneapolis Jaycees' Harrington Award for outstanding achievement in public health, and in 1962 won the Distinguished Service Award of the St. Paul Kiwanis Club. He has served dozens of organizations as friend and counselor.

Ray and his wife, Margaret, live at 1575 Northrop, St. Paul, Minn. He was born in that city in 1895, and received a degree in pharmacy from the University in 1920. He served as pharmacist at the University Hospitals 1921-24; assistant hospital manager, 1924-29; hospital manager, 1929-32; and assistant director until 1935, when he was appointed director. He also holds the rank of professor of hospital administration. His "alumni" in hospital administration are located throughout the world.

Dr. John R. Amberg (Med. '49) of Milwaukee, Wis., his son, and Mrs. Mikkell Kelley of Albuquerque, New Mex., his daughter, attended the Recognition Dinner along with other relatives. Congratulatory telegrams and letters poured in, and a giant telegram of good wishes, bearing the names of all those attending the dinner, was delivered to the honored guest.

**ELMER H. AND MARGARET J. SMITH
ENDOW SCHOLARSHIP WITH
MINNESOTA MEDICAL FOUNDATION**

The Scholarship Endowment Program of the Minnesota Medical Foundation has been enhanced by a gift of \$19,200.00 from Mr. and Mrs. Elmer H. Smith of Minneapolis. Their donation provides for a permanent annual scholarship award which will be worth \$750.00 to a meritorious student at the University of Minnesota Medical School.



Awarding of the initial scholarship will be in September, 1963, according to Dr. Corrin H. Hodgson, president of the Foundation. It will be known as the Elmer H. and Margaret J. Smith Scholarship, and will be awarded to a student who demonstrates outstanding academic achievement as well as financial need.

Endowed scholarships are those which are supported in perpetuity by the earnings of a principal sum contributed to the Minnesota Medical Foundation and held in trusteeship by the Foundation for that purpose. The pattern of such scholarships was established in 1962 when the family of the late Dr. Charles N. Hensel, St. Paul, established a memorial scholarship in his name with the Foundation. The Hensel Endowment now exceeds \$26,000.

Dr. Hodgson praised the donors of both scholarships for their "thoughtful philanthropy" and stressed the lasting value of the gifts. "Fifty medical students will receive important assistance during the next fifty years from each of these endowments," he said. The Foundation hopes to convert a substantial portion of its annual scholarship program to a permanent endowment basis, he added, inviting friends of medical education to help. A brochure outlining the Scholarship Endowment Program may be obtained from the Foundation office, 1342 Mayo Building, University of Minnesota Medical School, Minneapolis 14, Minn.

1963 INTERNSHIP ASSIGNMENTS ANNOUNCED

Members of the Class of 1963, University of Minnesota Medical School, will scatter throughout the United States for internships after receiving their medical degrees in graduation ceremonies June 15th.

Assigned under the National Intern Matching Program, 123 seniors are preparing to spend a year in on-the-job medical training and practice. Forty-eight of the graduates will intern in Minnesota hospitals. Thirty-two others are journeying to California, which annually attracts many Minnesotans for the internship year. Fifteen other states are included in the list of destinations.

Fifteen graduates are assigned to Ancker Hospital, St. Paul, and fifteen to Cook County Hospital, Chicago, Ill.

The 1963 internship list:

ADAMS, RICHARD I. Ancker Hospital St. Paul, Minn.	CHRISTENSON, PETER C. Milwaukee County Hospital Milwaukee, Wis.
AMBROSON, ROGER D. Sacramento County Hospital Sacramento, Calif.	COLLINGE, JAMES A. Philadelphia General Hospital Philadelphia, Pa.
AMENT, MARVIN E. Univ. of Minn. Hospitals Minneapolis, Minn.	CRUTCHFIELD, CHARLES Ancker Hospital St. Paul, Minn.
ANDERSON, HANS P. Mary Fletcher Hospital Burlington, Vt.	CRUTCHFIELD, SUSAN St. Mary's Hospital Minneapolis, Minn.
ANDERSON, JOHN D. Ancker Hospital St. Paul, Minn.	DECKER, CHARLES Cook County Hospital Chicago, Ill.
AVANT, ROBERT F. San Bernardino County Hosp. San Bernardino, Calif.	DICKINSON, PAUL B. Cook County Hospital Chicago, Ill.
BAKER, RICHARD C. Minneapolis General Hospital Minneapolis, Minn.	DUNN, JAMES P. Bethesda Hospital St. Paul, Minn.
BALCHUNAS, STANLEY R. Ancker Hospital St. Paul, Minn.	ECKHOLDT, JOHN W. University Hospitals Baltimore, Md.
BERAN, RUSSELL E. Nebraska Methodist Hospital Omaha, Nebr.	EDWARDS, MICHAEL G. Maricopa County General Hosp. Phoenix, Ariz.
BERGH, ALLEN V. Cook County Hospital Chicago, Ill.	EDWARDSON, PHILLIP L. Mt. View Hosp. Pierce Co. Tacoma, Wash.
BOSLAND, JON H. St. Mary's Hospital Duluth, Minn.	EHLEN, CHARLES P. Cook County Hospital Chicago, Ill.
CAMERON, ROBERT W. Univ. of Utah Affiliated Hosp. Salt Lake City, Utah	EISENKLAM, ERIC J. Univ. of Minn. Hospitals Minneapolis, Minn.
CAPISTRANT, TERRENCE Univ. of Oregon Hospitals Portland, Ore.	

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- ELLIS, EDWARD A.
St. Mary's Hospital
Minneapolis, Minn.
- ELSTROM, JOHN A.
Cook County Hospital
Chicago, Ill.
- ENGBRETSON, PAUL H.
Sacramento County Hospital
Sacramento, Calif.
- ERICKSON, HARTLEY J.
Cook County Hospital
Chicago, Ill.
- ERICKSON, LARRY R.
General Hosp. of Riverside
Riverside, Calif.
- EVENSON, MARTIN A.
St. Mary's Hospital
Duluth, Minn.
- FARR, JOHN O.
Cook County Hospital
Chicago, Ill.
- FOX, ABE L., JR.
Receiving Hospital
Detroit, Mich.
- FRISBIE, DENNIS C.
Sacramento County Hospital
Sacramento, Calif.
- GALLAGHER, LARRY J.
Ancker Hospital
St. Paul, Minn.
- GERSTENKORN, G. BRUCE
Ancker Hospital
St. Paul, Minn.
- GILBERTSON, ROGER L.
Minneapolis General Hospital
Minneapolis, Minn.
- GORDER, JAMES I.
Cook County Hospital
Chicago, Ill.
- HAGEMAN, ARNOLD P.
Memorial Long Beach
Long Beach, Calif.
- HALLQUIST, BEVERLY M.
Beth El Hospital
Brooklyn, New York
- HANEK, ROBERT D.
Denver General Hospital
Denver, Colorado
- HANSON, A. STUART
Minneapolis General Hospital
Minneapolis, Minn.
- HARANO, RICHARD C.
Sacramento County Hospital
Sacramento, Calif.
- HENKE, CLARENCE E.
Ancker Hospital
St. Paul, Minn.
- HERTSGAARD, DAVID B.
Orange County General Hospital
Orange, Calif.
- HOBDAY, H. THOMAS
Cook County Hospital
Chicago, Ill.
- HOLSTAD, CREIGHTON
Cook County Hospital
Chicago, Ill.
- HOUSE, JAMES H.
Ancker Hospital
St. Paul, Minn.
- HUBER, ROBERT P.
San Joaquin General Hospital
Stockton, Calif.
- ISAKSON, PAUL J.
Southern Pacific General Hosp.
San Francisco, Calif.
- JACOBSEN, DENNIS D.
San Joaquin General Hospital
Stockton, Calif.
- JENSEN, BRUCE L.
Bethesda Hospital
St. Paul, Minn.
- JOHNSON, BRADLEY D.
San Bernardino County Hospital
San Bernardino, Calif.
- JOHNSON, RICHARD W.
Minneapolis General Hospital
Minneapolis, Minn.
- KAISER, DALE C.
U.S. Naval Hospital
Camp Pendleton, Calif.
- KAYE, DALE R.
Orange County General Hospital
Orange, Calif.
- KEPLINGER, JAMES B.
Mt. View Hosp. Pierce Co.
Tacoma, Wash.
- KNUDSEN, H. DAVID
St. Mary's Hospital
Minneapolis, Minn.
- KOELZ, THOMAS A.
St. Luke's Hospital
Duluth, Minn.
- KOROPCHAK, NIKOLAI
Santa Clara Hospital
San Jose, Calif.
- KRASNOW, BRIAN M.
Santa Clara Hospital
San Jose, Calif.
- KUEHN, KLAUS
Univ. of Calif. Affiliated Hosp.
Los Angeles, Calif.
- KUNERT, RAOUL T.
Cook County Hospital
Chicago, Ill.
- LARSON, ALLEN K.
Santa Clara Hospital
San Jose, Calif.
- LARSON, JERROLD V.
San Bernardino County Hospital
San Bernardino, Calif.

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- LARSON, ROLF H.
Minneapolis General Hospital
Minneapolis, Minn.
- LEACH, THOMAS C.
Ancker Hospital
St. Paul, Minn.
- LEIDER, LLOYD L., JR.
Philadelphia General Hospital
Philadelphia, Penn.
- LINDHOLM, ROBERT N.
Philadelphia General Hospital
Philadelphia, Penn.
- LINDQUIST, JANET M.
Philadelphia General Hospital
Philadelphia, Pa.
- MACK, ROBERT F.
St. Mary's Hospital
Duluth, Minn.
- MAEDER, EDWARD C.
Santa Clara Hospital
San Jose, Calif.
- MAHLER, JOHN H.
Cook County Hospital
Chicago, Ill.
- MALONE, PATRICK M.
St. Mary's Hospital
Duluth, Minn.
- MASTBAUM, LEONARD I.
Ancker Hospital
St. Paul, Minn.
- MATHISON, ROBERT D.
St. Mary's Hospital
Minneapolis, Minn.
- McCANN, STEPHEN W.
Orange County General Hospital
Orange, Calif.
- McMULLEN, JOHN B.
Mt. View Hosp. Pierce Co.
Tacoma, Wash.
- MEDELMAN, JAMES K.
Ancker Hospital
St. Paul, Minn.
- MENNIS, WILLIAM I.
Sacramento County Hospital
Sacramento, Calif.
- MONSON, DAVID O.
Cook County Hospital
Chicago, Ill.
- NELSON, DAVID L.
Bethesda Hospital
St. Paul, Minn.
- NELSON, GLEN D.
Minneapolis General Hospital
Minneapolis, Minn.
- NESSE, ANTON S.
Minneapolis General Hospital
Minneapolis, Minn.
- NICHOLS, NED B.
University of Oregon Hosps.
Portland, Oregon
- OLSON, RICHARD T.
Santa Clara Hospital
San Jose, Calif.
- PEMBROOK, RICHARD C.
U. S. Pub. Health Service Hosp.
San Francisco, Calif.
- PERSON, DONALD A.
Minneapolis General Hospital
Minneapolis, Minn.
- PESONEN, CLIFFORD A.
Orange County General Hospital
Orange, Calif.
- PETERSON, JOHN O.
Philadelphia General Hospital
Philadelphia, Penn.
- POSTON, LAWRENCE M.
Bethesda Hospital
St. Paul, Minn.
- PRATT, DEAN B.
Minneapolis General Hospital
Minneapolis, Minn.
- QUAKENBUSH, JAMES H.
Santa Clara Hospital
San Jose, Calif.
- REED, WILLIAM C.
Santa Clara Hospital
San Jose, Calif.
- RIEKE, ALYSON P.
Kaiser Foundation
San Francisco, Calif.
- ROBNIK, SPENCER L.
Santa Clara Hospital
San Jose, Calif.
- RYAN, PATTY J.
St. Mary's Hospital
Minneapolis, Minn.
- SARGENT, JOHN H.
Bethesda Hospital
St. Paul, Minn.
- SCANLAN, JOHN M.
Cook County Hospital
Chicago, Ill.
- SCANLON, HUGH
Bethesda Hospital
St. Paul, Minn.
- SCHNEIDER, ROBERT L.
Mt. Sinai Hospital
Minneapolis, Minn.
- SCHULTZ, ALAN K.
U. S. Naval Hospital
Philadelphia, Pa.
- SHER, MICHAEL M.
Kings County Hospital
Brooklyn, New York
- SIEBERT, RICHARD C.
Presbyterian St. Luke's Hospital
Chicago, Ill.

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- SLETTEN, RICHARD G.
Santa Clara Hospital
San Jose, Calif.
- SMITH, BARLOW
Ancker Hospital
St. Paul, Minn.
- SOLBERG, LEIF
University Hospitals
Baltimore, Md.
- STENZEL, JOSEPH
St. Mary's Hospital
Minneapolis, Minn.
- STRAND, PETER J.
Bethesda Hospital
St. Paul, Minn.
- STRATTE, JON
Ancker Hospital
St. Paul, Minn.
- SUDDARD, ALAN C.
Maricopa County General Hospital
Phoenix, Ariz.
- SWANSON, DAVID A:
Bethesda Hospital
St. Paul, Minn.
- SWENSON, ORVILLE
Cook County Hospital
Chicago, Ill.
- TUCK, MICHAEL
Philadelphia General Hospital
Philadelphia, Pa.
- ULLYOT, DANIEL
Boston City Hospital
Boston, Mass.
- VENER, JOHN M.
Ancker Hospital
St. Paul, Minn.
- VER STEEG, H. JAMES
Santa Clara Hospital
San Jose, Calif.
- WALSER, ADOLF
Bethesda Hospital
St. Paul, Minn.
- WASHA, DARRYL
St. Mary's Hospital
Duluth, Minn.
- WATSON, JOHN
Orange County General Hospital
Orange, Calif.
- WHEELER, JOHN W.
Parkland Memorial Hospital
Dallas, Texas
- WILLIAMSON, KENNETH
W. Virginia University Hospital
Morgantown, W.V.
- ZAFF, JOHN D.
Ancker Hospital
St. Paul, Minn.

RESEARCH GIFT

The Minnesota Medical Foundation is the recipient of a \$1,500.00 gift from the Schwan Ice Cream company, Marshall, Minn., for support of heart disease and cancer research at the University of Minnesota. The contribution marks the fourth straight year in which Mr. Marvin Schwan, company president, has aided medical research in lieu of making Christmas gratuities to customers.

In 1963, the Foundation will use the gift to help finance its permanent heart disease and cancer research fund available to medical students and junior faculty members.

The Schwan Ice Cream company makes funds available in a similiar manner annually to the state universities of Iowa, Nebraska, Illinois, Wisconsin, and South Dakota.

Faculty News

SURGERY

C. Walton Lillehei, professor, was awarded the American College of Cardiology's Susan and Theodore Cummings Humanitarian Award for inspired teaching of cardiology. He has been on the faculty since 1949.

DERMATOLOGY

Henry E. Michelson, professor emeritus, was honored in February at a meeting of the Minnesota Dermatological Society. His portrait, painted by Mr. S. Rettégi, was commissioned by a group of dermatologic associates and former graduate students, and was unveiled at the dinner. It was presented to the Medical School. Dr. Michelson received the University of Minnesota Outstanding Achievement Award in 1960.

PHYSIOLOGY

Carlos A. Martinez, professor, presented a paper April 18, 1963 before the 47th annual meeting of the Federation of American Societies for Experimental Biology in Atlantic City, N.J. In it he described how he and associates at the Medical School had successfully induced tolerance to transplants in mice by repeated injections of non-living spleen cell material taken from a donor strain of animal. He said the experiments had overcome the strongest as well as the weakest genetical barriers in mice to acceptance of foreign tissue. A colleague and co-worker, Dr. Robert A. Good, predicted the technique, if applied successfully to man, "could usher in the transplantation era." "Its application to humans," he said, "seems only a technical problem."

ANCKER HOSPITAL

Homer D. Venter, Jr. was appointed first chief of pediatrics at Ancker since 1957. He holds the rank of assistant professor in the Medical School.

Gilbert Ross, instructor in neurology, was appointed head of the neurology department, first such appointee in the hospital's history.

PEDIATRICS

Robert A. Ulstrom, professor, in January received a grant of \$5,000 for medical research from Wyeth Laboratories, Philadelphia, Pa. The grant is unrestricted, and may be used at the discretion of the recipient. It is one of a number made annually by Wyeth to further medical research at hospitals and medical schools.

Warren J. Warwick, assistant professor, has reported a new grant of \$22,333 has been received from the National Cystic Fibrosis Research Fund for continuation of the Cystic Fibrosis Regional Care, Research and Teaching Center at University Hospitals. Dr. Warwick is director of the center.

DR. ALBERT E. RITT ELECTED

Dr. Albert E. Ritt (Med. '32), St. Paul, Minn., was installed April 3, 1963 as president of the American Academy of General Practice. He assumed leadership of the 28,000-member medical organization at its annual meeting in Chicago, Ill., and will serve as president for one year. He has long been active in AAGP national affairs.



ALBERT E. RITT

Dr. Ritt was among the organizers of the Minnesota Academy of General Practice in 1946, and served as president of this constituent unit in 1951. Al interned at St. Mary's Hospital, Minneapolis, and went into practice in 1934.

In addition to his medical practice, Dr. Ritt is president of the Midway National Bank of St. Paul, is vice president of two other banks, a partner in an insurance company, and is associated in a plastic laminating company. He is married to the former Ange Herman, and they have three children.

DR. ERICSSON VISITS CONGO

A 28-year ambition was fulfilled recently by Dr. Martin C. Ericsson (Med. '34), former Minneapolis physician who now practices in Cedar Falls, Ia. He spent four months last winter as a medical missionary in the Congo, practicing medicine and surgery under sponsorship of the Congo Protestant Relief Agency.

As the only doctor within 100 miles, and providing medical care for an estimated 60,000 people, Dr. Ericsson found jungle practice in Africa to be decidedly different from that he has known in midwest America.



MARTIN ERICSSON

"I had always wanted to practice in a foreign land," he writes. "When I accepted the opportunity to go to Africa, I found a 50-bed hospital with no electricity, no x-rays, no air conditioning, and no lights. We got along with kerosene lanterns and flashlights." He saw about 125 outpatients daily, who presented a wide range of diseases. Obstetrics was a particularly interesting problem. He performed many Caesarian sections. "Many of the native women travel 50 miles to reach the hospital after the onset of labor, sometimes walking, carried in a net, or occasionally riding a bicycle over the bumpy roads," he said. The fee for a Caesarian section in the Congo is \$2.00, he reported, and a week in the hospital costs about 20 cents.

Dr. Ericsson flew to Leopoldville on September 4, 1962. His wife, Martha, joined him in his remote locale 1,000 miles northeastward two months later. She assisted him at the Covenant Church hospital, established in 1956, along with two American nurses.

"We really hated to leave," he writes, "because of the tremendous need for medical help in that part of the world. It was a rewarding experience."

STUDENT CENTER FUND DRIVE NEARS COMPLETION

Final phase of the Medical Alumni Student Center Project fund drive is underway this Spring under sponsorship of the Minnesota Medical Alumni Association. Dr. V. J. P. Lundquist, (Med. '42), project chairman, said \$22,000 remains to be raised to complete the \$100,000 capital campaign.

Construction of the Center will begin soon in the Mayo Memorial Building, University Hospitals. Opening is expected next Fall. The Center will occupy approximately 3,500 square feet in the basement, and provide a rest, relaxation, study, lunching, and on-call area for the 550-member medical student body.

More than \$78,000 in cash and pledges has been received to date. The Board of Trustees and Executive Committee of the Association are spearheading the final phase.

ANNUAL MEETING

The Minnesota Medical Alumni Association will hold its annual meeting Friday, October 25, 1963 at the Radisson Hotel, Minneapolis. The Class of 1938 will be honored at the dinner-dance on the occasion of its 25th anniversary since graduation, and will provide a special class gift for the Medical Alumni Student Center project. Dr. Linneus Idstrom, and Dr. Conrad Karleen are co-chairmen of the reunion. Dr. Robert H. Monahan (Med. '42) is general chairman of the annual meeting, which will have as its theme, "International Travel."

On Saturday, October 26, medical alumni can attend in a group the Minnesota-Michigan homecoming football game in Memorial Stadium. The Alumni Association has reserved a block of tickets for those who wish to attend.

Alumni Notes

▲ 1922

Alexander E. Brown, a member of the Mayo Clinic Staff since 1925, retired April 1, 1963. He and Mrs. Brown are now residing in Cortez, Fla. Dr. Brown was chief of the clinical laboratory at the University of Minnesota Hospitals in 1920, and interned at Ancker Hospital, St. Paul. He practiced in Stillwater, Minn. before joining the Mayo Clinic staff.

▲ 1926

W. B. Pierce has retired after nearly 36 years of practice in Bismarck, N.D. His last affiliation was as a staff surgeon with the Quain and Ramstad Clinic.

William B. Stryker was named director of the Kent State (O.) University Health Service. He was a physician and surgeon for 26 years with the U.S. Army Medical Corps.

▲ 1928

Herman E. Drill, who practices in Hopkins, Minn., was elected president of the medical staff at Abbott (Minneapolis) Hospital. He also has added physical therapy facilities at the Drill Clinic, Hopkins.

▲ 1929

Herman E. Hilleboe has resigned his post as health commissioner of the State of New York, to become consultant on medical affairs to Gov. Nelson Rockefeller of New York. He received the University of Minnesota Outstanding Achievement Award in 1951, and, at one time, was medical director of the Minnesota Health Department. He formerly practiced in Swanville, Minn.

▲ 1932

Caroline E. Helmick has retired after 13 years as director of the student health service at the Women's College, Duke University, Durham, N.C.

▲ 1935

Don R. Mathieson, senior consultant in clinical pathology in the Mayo Clinic, is on an extended visit to observe ten blood transfusion services in seven European nations, including Russia. He will return early in June.

▲ 1936

John T. Litchfield was appointed director of research at Lederle Laboratories Division of American Cyanamid Co., Pearl River, N.Y. He was an assistant professor of pharmacology at the University of Minnesota when he joined Cyanamid in 1945.

Julius H. Winer and **Martin M. Even** (Med. '39) announce their association in the practice of urology with offices at 9915 Santa Monica Blvd., Beverly Hills, Calif., and at 11103 Venice Blvd., Los Angeles 34, Calif.

▲ 1939

William B. Stromme, Minneapolis obstetrician-gynecologist, is on a two-month tour of the Orient, including an appointment as Visiting Research Associate April 25-May 20 at the University of Singapore Medical School.

▲ 1942

Daniel Levenson writes that he has completed twenty years of general practice, 15 of which have been in Inglewood, Calif. He lives at 4004 Kenway, Los Angeles, with his wife, Irene, and four children.

▲ 1945

William F. Maloney has been appointed an associate director of the Association of American Medical Colleges effective July 1, and will relinquish his post as dean of medicine at the Medical College of Virginia. A native of Minneapolis, he was an assistant dean of the University of Minnesota Medical School before moving to Virginia in 1957.

▲ 1948

Robert T. Collins was elected chief of the medical staff at the new Roseau, Minn., area hospital.

▲ 1954

Oleg Jardetsky, assistant professor of pharmacology at Harvard Medical School, was awarded a National Science Foundation research grant of \$90,000 to support research on "Nuclear Magnetic Resonance Studies of Biologically Important Molecules." He also served as Visiting Professor of Biophysics at the State University of New York, Buffalo, N.Y., last winter.

▲ 1954

Donald S. Mattson has been appointed a resident in internal medicine in the Mayo Foundation, Rochester, Minn.

Bruce A. Kottke was awarded the Ph.D. in Medicine from the University of Minnesota on December 15, 1962, and is now a consultant in internal medicine at the Mayo Clinic, Rochester, Minn. He completed his residency training there in December.

▲ 1955

Alvin S. Zelickson, clinical instructor in dermatology at the Medical School, is the author of "Electron Microscopy of Skin and Mucous Membrane," a 173-page book published in 1963 by the Charles C. Thomas Co., Springfield, Ill.

▲ 1956

Richard A. Greenberg is now practicing psychiatry in Manhattan Beach, Calif. His new office is located at 856 Manhattan Beach Blvd.

Curtis Stolee is now associated in practice with the Bloomington-Lake Clinic, Minneapolis, Minn.

▲ 1957

Joseph H. Eusterman received an M.S. degree in Medicine from the University of Minnesota on December 15, 1962. He is a resident in internal medicine at the Mayo Foundation, Rochester, Minn.

▲ 1958

Gene G. Hunder has joined the Mayo Clinic staff as an assistant in the section of rheumatology. He entered the Mayo Foundation as a fellow in medicine in July, 1961.

Stuart B. Hoffman is now with the Medical Corps, U.S. Army, at Ft. Polk, La. He completed a residency in internal medicine at the Mayo Foundation, Rochester, Minn., in December, 1962.

Otto H. Ravenholt was appointed a lecturer in preventive medicine and community health at Kansas University Medical Center. He is presently health officer and director of the county health department, Topeka, Kans.

▲ 1959

Jerome C. Fluth is temporarily associated with the University Hospitals medical staff while completing his convalescence from burns. He was seriously burned September 21, 1962 by a gasoline explosion and fire at the Bamenda New Hope Settlement Hospital, Federal Republic of Cameroun, Africa, where he was serving as a medical missionary with the North American Baptist Church. Now receiving outpatient treatment at the Department of Physical Medicine and Rehabilitation, Dr. Fluth credits an associate missionary, Dr. Peter Fehr (Med. '57) with saving his life. Dr. Fehr, practicing 25 miles away in Africa, attended his badly-burned colleague with quick administration of fluids and skilled treatment during a critical three-week period following the accident.

On October 9, 1962, Dr. Fluth, accompanied by his wife and two children, was flown to Minneapolis for medical care at University Hospitals. A complete recovery is anticipated, and the Fluth family expects to return to Africa and a resumption of medical missionary work in 1963 or 1964.

Herbert S. Strait is now associated with the Glencoe, Minn. Medical Center, after practicing two years at the Lakeview Clinic, Waconia, Minn.

James R. Thompson has been appointed a resident in ophthalmology in the Mayo Foundation, Rochester, Minn.

▲ 1960

Richard Henry is now in private practice at Crosby, Minn.

▲ 1961

Stanley J. Simons, Jr., has been appointed a resident in ophthalmology in the Mayo Foundation, Rochester, Minn.

Robert D. Hilgers has been appointed a resident in obstetrics and gynecology in the Mayo Foundation, Rochester, Minn.

ALUMNI DEATHS

▲ 1905

Dr. Roy Lynde, Ellendale, N. D. Died November 26, 1962 at the age of 88 years, of congestive heart failure. A nursery in the Dickey (N. D.) County Hospital and the athletic field at Ellendale (N. D.) State Teachers College have been named for him. He was also featured in the April, 1961 issue of Reader's Digest in a "Most Unforgettable Character" article.

▲ 1913

Dr. William Francis Finley, O'Neill, Neb. Died December 7, 1962 at the age of 75.

▲ 1919

Dr. William A. Sawatzky, Minneapolis, Minn. Died February 9, 1963, after 44 years of general practice, at the age of 69. A member of the major medical societies, he is survived by his wife and two daughters.

▲ 1921

Dr. Ivor Theodore Dahlin, Aurora, Minn. Died November 28, 1962 of myocardial infarction at age 65. He was a veteran of World War I, and had retired in 1956 because of disability. Dr. Dahlin practiced alone for 29 years in Aurora. He had attended the 40th reunion of the Class of 1921-22 held at the Medical School on June 9, 1962.

▲ 1935

Dr. Wilburn O. B. Nelson, St. Peter, Minn. Died December 3, 1962 of coronary thrombosis at the age of 54. He had practiced for many years in Fergus Falls, Minn.

Student News

Robert S. Brown, 24-year-old Medical School junior from St. Paul, Minn., was awarded a \$1,525 Foreign Fellowship from the Association of American Medical Colleges, and will spend his "free time" in the summer of 1963 working in a mission hospital in South Africa.

He was among 31 U. S. medical students to receive such 1963 overseas opportunities under a \$60,000 grant from Smith Kline & French Laboratories, the objective of which is to enable recipients to obtain supervised medical experience in underdeveloped countries. It also affords a chance to live and work in relatively primitive cultures which present challenging medical and social problems.

Brown will be stationed at the Anglican Mission Hospital, Nqutu, Zululand. Following the three months in Africa, he will spend his "elective time" at the Medical School of the University of Birmingham in England. He will leave the U. S. A. June 18th.

Stephen F. Hodgson, Medical School junior from Rochester, Minn., is now in England where he is studying for three months at St. Mary's Hospital in London. Mrs. Hodgson is with him.

John B. McMullen, senior, has returned after spending three months at the School of Medicine, Edinburgh, Scotland, where he lived and studied as a medical exchange student.

Spring quarter enrollment in the Medical School is 514, compared with 471 at this time in 1962. Total University of Minnesota enrollment during the Spring quarter is 29,305, approximately 10 percent greater than the corresponding period one year ago.

THE BULLETIN BOARD
Special Medical School Lectures
University of Minnesota
Minneapolis, Minnesota

- May 2 4:00 p.m., Mayo Auditorium
"Chemical Basis of Heredity, The Genetic Code"
Dr. Severo Ochoa, Professor of Biochemistry,
New York University College of Medicine,
New York City
- May 9-10 9:00 a.m., Mayo Auditorium
SYMPOSIUM
"Nutritional Aspects of Atherosclerosis"
Sponsor: Minnesota Heart Association
- May 16 4:30 p.m., Mayo Auditorium
GEORGE E. FAHR LECTURE
"Cardiovascular Surgery—Past and Present"
Dr. Alfred S. Blalock, Professor and Chair-
man of Surgery, Johns Hopkins University
School of Medicine, Baltimore
- May 22 4:30 p.m., Mayo Auditorium
J. S. BLUMENTHAL MEMORIAL LECTURE
*"Hypersensitivity to Small Molecules Includ-
ing Penicillin"*
Dr. Herman Eisen, Professor and Chairman
of Microbiology, Washington University
School of Medicine, St. Louis
- June 14 4:30 p.m., Mayo Auditorium
SENIOR RECOGNITION DAY PROGRAM
Speaker: Dr. Percival Bailey, Director of Re-
search, Illinois State Psychiatric Institute,
Chicago, Ill.

PHYSICIANS AND ALL OTHER
INTERESTED PERSONS WELCOME

MEDICAL ALUMNI EXCHANGE

PHYSICIAN WANTED for general practice, Kerkhoven, Minn. Contact Karl Helwig, M.D., Kerkhoven, Minn.

LOCUM TENENS wanted during all or parts of July and August. Contact Drs. St. Cyr and Williams, 4084 W. Broadway, Robbinsdale 22, Minn.

LOCUM TENENS OR ASSOCIATE wanted by Hendricks Clinic, Hendricks, Minn. Contact Dr. C. O. Thompson.

PEDIATRICIAN, board eligible or certified, wanted for permanent association in suburban Minneapolis practice. Write Dr. Wallace Lueck, 2220 Lowry Ave. N., Minneapolis 11, Minn.

GENERAL PRACTICE ASSOCIATE wanted by Dr. B. T. Bottolfson, 320 Center Avenue, Moorhead, Minn.

Memorial Gifts

Memorial gifts to the Minnesota Medical Foundation have been received recently in memory of:

Mrs. Sally H. Compere Dallas, Texas	Mr. Frank Van Deirse Minneapolis, Minn.
Mr. Richard A. Kunde Brainerd, Minn.	Mrs. Anna Lenvik Villard, Minn.

Mrs. Carol Balcome
St. Paul, Minn.

Memorial contributions are a practical means of honoring the memory of a friend or loved one, while helping the Minnesota Medical Foundation in the advancement of medical education and research.

Coming Events

University of Minnesota Medical School

CONTINUATION COURSES FOR PHYSICIANS

1963

University of Minnesota
Center for Continuation Study

- April 18-20 Otolaryngology
- April 25-27 Obstetrics
- April 29-May 1 Ophthalmology
- May 16-18 Surgery
- May 27-29 Psychiatry
- June 3-5 Anesthesiology
- June 11-14 Human Chromosome Techniques

The University of Minnesota reserves the right to change this schedule without notification.

Courses are held at the Center for Continuation Study or the Mayo Memorial Auditorium on the campus of the University of Minnesota. Usual tuition fees are \$45 for a two-day course, \$65 for a three-day course, and \$80 for a one-week course.

Specific announcements are sent out about two months prior to each course to all members of the Minnesota State Medical Association and to any physicians who request information for a specific course. For further information write to:

DIRECTOR
DEPARTMENT OF CONTINUATION MEDICAL EDUCATION
THE MEDICAL CENTER (BOX 193)
UNIVERSITY OF MINNESOTA
MINNEAPOLIS 14, MINNESOTA

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choose your
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Your memorial gift to the Minnesota Medical Foundation expresses dignified respect to the memory of a relative, friend, colleague, former teacher, or fellow alumnus. It also provides thoughtful aid to the medical education and research at the University of Minnesota Medical School.

Memorial gifts are acknowledged promptly to donor and family of the deceased. Group donations also accommodated.

When you choose a memorial gift, your contribution, with appropriate details, may be sent to:

MINNESOTA MEDICAL FOUNDATION
Box 193 — University Hospitals
Minneapolis 14, Minnesota