

UNIVERSITY OF MINNESOTA

Medical Bulletin

OFFICIAL PUBLICATION OF THE

UNIVERSITY OF MINNESOTA HOSPITALS

THE MINNESOTA MEDICAL FOUNDATION

AND THE MINNESOTA MEDICAL ALUMNI

ASSOCIATION

NUMBER 1

VOLUME XXIX

IN THIS ISSUE:

Cholangiolitic Cirrhosis

University of Minnesota Medical Bulletin

Editor

N. L. GAULT, JR., M.D.

Associate Editors

E. B. BROWN, Ph.D.

WILLIAM F. SCHERER, M.D.

GILBERT S. CAMPBELL, M.D.

WESLEY W. SPINK, M.D.

BYRON B. COCHRANE, M.D.

EUGENE L. STAPLES

ROBERT B. HOWARD, M.D.

ROBERT A. ULSTROM, M.D.

Copy Editor

ELLEN Y. SIEGELMAN

University of Minnesota Medical School

J. L. MORRILL, *President, University of Minnesota*

HAROLD S. DIEHL, M.D., *Dean, College of Medical Sciences*

ROBERT B. HOWARD, M.D., *Associate Dean*

N. L. GAULT, JR., M.D., *Assistant Dean*

H. MEAD CAVERT, M.D., *Assistant Dean*

University Hospitals

RAY M. AMBERG, *Director*

Minnesota Medical Foundation

WESLEY W. SPINK, M.D., *President*

R. S. YLVISAKER, M.D., *Vice-President*

N. L. GAULT, JR., M.D., *Secretary-Treasurer*

Minnesota Medical Alumni Association

BYRON B. COCHRANE, M.D., *President*

VIRGIL J. P. LUNDQUIST, M.D., *First Vice-President*

SHELDON M. LAGAARD, M.D., *Second Vice-President*

LEONARD A. BOROWICZ, M.D., *Secretary*

JAMES C. MANKEY, M.D., *Treasurer*

UNIVERSITY OF MINNESOTA

Medical Bulletin

OFFICIAL PUBLICATION OF THE UNIVERSITY OF MINNESOTA HOSPITALS, MINNESOTA MEDICAL FOUNDATION, AND MINNESOTA MEDICAL ALUMNI ASSOCIATION

VOLUME XXIX

October 15, 1957

NUMBER 1

CONTENTS

STAFF MEETING REPORT

Cholangiolitic Cirrhosis

BY F. W. Hoffbauer, M.D. 2

EDITORIAL 19

MINNESOTA MEDICAL FOUNDATION 21

MEDICAL SCHOOL ACTIVITIES 23

POSTGRADUATE EDUCATION 25

COMING EVENTS 27

MEDICAL SCHOOL FACULTY 28

Published semi-monthly from October 15 to June 15 at Minneapolis, Minnesota

U OF M LIBRARY APR 23 '59

Staff Meeting Report

Cholangiolitic Cirrhosis*

F. W. Hoffbauer, M.D.†

The terms "cholangiolitic cirrhosis" and "cholangiolitic hepatitis" are useful in describing certain chronic liver disorders that exhibit intrahepatic biliary obstruction. The difficulties that result from the use of these two designations stem from the fact that they are pathological terms more widely employed by clinicians than by pathologists. The clinician understands the words quite definitely to denote a certain symptom complex. The pathologist, on the other hand, may not see a characteristic and distinct histologic picture in the liver biopsies or the autopsy sections from patients diagnosed in these terms. The problem involved has been concisely and somewhat differently expressed in a recent monograph on liver disease:¹

This condition has been called, more for the lack of a better term than on the strength of histologic evidence, *cholangiolitic*, and an increased permeability of the cholangioles for biliary substances which regurgitate into the blood has been proposed as the explanatory mechanism. The etiology of cholangiolitis has not been established.

The uncertainty that prevails in this group of disorders constitutes a distinct handicap for all concerned. One cannot be certain that all patients considered as examples of cholangiolitic cirrhosis or hepatitis actually do suffer from a single disease. Such individuals do have certain features in common, however: The classic example of a patient with cholangiolitic cirrhosis is a well-developed, well-nourished, middle-aged woman with a melanotic pigmentation of the skin. Her sclerae are icteric, and her liver is enlarged, readily palpable, but not tender. The spleen is palpable. The skin over the arms and legs is thickened and shows evidence of self-inflicted scratch marks. The patient complains bitterly of pruritus.

This disorder has been extensively described in the medical literature of the past 75 years. The multiplicity of terms employed† indicates the confusion that has existed and still exists. But one fact

*This report was given at the Staff Meeting of the University of Minnesota Hospitals on October 11, 1957.

†Associate Professor, Department of Medicine.

‡A partial list of terms that have been applied to this or closely related disorders include: Hanot's hypertrophic cirrhosis, chronic intrahepatic obliterating cholangitis, non-obstructive cholangitic biliary cirrhosis, pericholangiolitic biliary cirrhosis, xanthomatous biliary cirrhosis.

appears to be clear: adult females are the most susceptible to this disorder.

Kunkel, who prefers to call it "primary biliary cirrhosis," gives in his concise description² an excellent review of the older as well as recent literature on the subject. The pathological changes in the liver, especially those seen in the early phases of the disorder, were virtually unknown before the era of liver biopsy. The findings have now been described in detail by MacMahon.³ The structural alterations that occur in the liver as the disease progresses have been well described and illustrated by Popper and Elias.⁴ Observations made at this hospital on a group of patients with cholangiolitic hepatitis and with cholangiolitic cirrhosis were reported by Watson and Hoffbauer in 1946.⁵ A detailed report of 17 female patients with primary biliary cirrhosis studied at the Rockefeller Institute by Ahrens and his co-workers appeared in 1950.⁶

The cases chosen for the present preliminary report were selected in an attempt to learn something of the natural history of this disorder. Not every case of cholangiolitic hepatitis or cirrhosis seen at this hospital has been included, but no case of *chronic* cholangiolitic hepatitis or cholangiolitic cirrhosis in an adult female has deliberately been omitted. As yet no detailed search of the hospital files has been made for cases of this disorder in males. The writer, however, has not personally seen a typical case of cholangiolitic cirrhosis in an adult male patient during the period covered by this study.

The case histories of 30 adult female patients studied at the University of Minnesota Hospitals during the twelve-year period 1945 to 1956 have been reviewed and it was found that in each instance a *clinical* diagnosis of cholangiolitic hepatitis or cirrhosis had been made. This diagnosis was considered to be well established by clinical and biochemical findings; in most instances it was supported by histologic evidence, liver biopsies being available for examination in 27 instances. Among other findings, the present series of cases confirms the view of Kunkel² that no particular race among women is especially susceptible to this disease. Nor is there evidence that the disorder is commonest among individuals of a particular economic status. In the present series, 15 patients were referred to this hospital for consultation as private patients; the other 15 were classified as indigent. Twenty-six of the patients were residents of Minnesota, three were from other states, and one came from Venezuela. Three of the patients were single. Nearly all of the married women had borne children. The fate of 20 of the patients is known: 13 are dead

and seven survive at the present time. The status of ten patients is unknown at present. Seventeen patients had multiple admissions to the University Hospital; the patient described as Case 2 was admitted 24 times, and in many instances the periods between multiple admissions were interspersed with visits to the Outpatient Clinic. A careful review of the multiple medical histories recorded by clinical clerks, internes, house officers, and staff has so far failed to reveal a significant incidence of any antecedent illness or event common to a majority of these women that might relate to the onset of the disease.

The distinction between cholangitic (secondary biliary) cirrhosis and cholangiolitic (primary biliary) cirrhosis is difficult unless the status of the common bile duct is known. The common bile duct was demonstrated to be patent and free of stricture, stone, or cancer in 27 of the 30 patients. In 13 instances this was established by operation at the University Hospital, in eight others by previous operative cholangiograms at another hospital (Table 1), and in the other six cases necropsy data were available. Although the exact status of the extrahepatic bile duct system was unknown in three patients, the diagnosis of cholangiolitic cirrhosis appeared to be well established by other evidence.

Clinical Aspects

Table 1 summarizes certain clinical features noted in the present series of 30 cases. The cases are numbered according to the year the patient was first seen, and the observations listed were those made at the time of the *initial study* at the University Hospitals. It was often difficult to ascertain the previous duration of the disease because the onset of the disease is characteristically insidious. While both the patient and the doctor usually assume that the disorder began with the first appearance of jaundice, actually pruritus and pigmentation of the skin may precede jaundice by several years. Thus the duration of the disease stated in Table 1 is at best an estimate.

The two most frequent symptoms in these patients were fatigue and pruritus. Later in the course of this illness the patients often had additional complaints. (Gastrointestinal complaints were surprisingly uncommon, at least until ascites appeared.) Itching of the skin was the most distressing symptom in the majority of instances. The pruritus was most severe at night and often interfered with sleep. As a group these women were pleasant and cooperative patients. Only one patient was severely hypochondriacal (Case 8); she had had an

TABLE 1
DATA ON 30 FEMALE PATIENTS WITH CHOLANGIOLITIC HEPATITIS OR
CIRRHOSIS OBSERVED AT THE UNIVERSITY OF MINNESOTA HOSPITALS
IN A 12 YEAR PERIOD (1945-1956)

Case No.	Patient	INITIAL OBSERVATIONS									COMMENTS			
		Yr. of 1st U.M.H. Study	Age	Pre-existing Symptoms (Estimated)	Skin Pigmentation	Pruritus (on admission)	Xanthoma or Xanthelasma	Ascites (on admission)	Spleen Palpable	Total Bilirubin (Serum)	(1) Liver Biopsy (year)	(2)	(3) Operative Cholangiogram (year)	(4)
1.	Mrs. A.	1943	52	4 years	++	+	Absent	Absent	-? -	0.7		'43		Necropsy 1945
2.	Mrs. B.	1945	39	8 years	+++	+++	Absent	Absent	+	2.0		'45		Necropsy 1953
3.	Miss C.	1945	47	6 years	+++	+++	Absent	Absent	+	4.1		'46		P-C Shunt -'46*
4.	Mrs. D.	1945	57	?	+++	++	Absent	Absent	+	2.6		'45		Dead **
5.	Mrs. E.	1945	56	4 years	+++	+++	Absent	Absent	+	0.7		'45		Alive 1957
6.	Mrs. F.	1947	47	7 years	+++	+++	Absent	Absent	-? -	2.7		'47		Unknown
7.	Mrs. G.	1948	47	7 years	+++	+++	Absent	Absent	Removed	13.6	'44	'48	'44	Necropsy 1951
8.	Mrs. H.	1948	43	1 year	+++	+++	Absent	Absent	+	5.1		'48		Unknown
9.	Mrs. I.	1948	62	5 years	+++	+++	Absent	Absent	+	5.5		'48		Unknown
10.	Mrs. J.	1949	54	1 year	+++	+++	Absent	Absent	+	10.0		'49		Died, hepatic failure '56
11.	Miss K.	1949	62	?	+++	++	Present	Absent	-	0.7		'49		Unknown
12.	Mrs. L.	1950	55	4 years	+++	+++	Absent	Absent	+	4.2		'56	'46	Necropsy 1957
13.	Mrs. M.	1950	71	7 years	+++	+++	Absent	Absent	+	2.9				Unknown
14.	Mrs. N.	1950	55	5 years	+++	+++	Absent	Absent	+	8.9	'48	'50	'49	Unknown
15.	Mrs. O.	1950	61	1 year	+++	+++	Absent	Absent	+	5.8		'50		Dead **
16.	Mrs. P.	1951	38	13 years	+++	+++	Present	Absent	Removed	5.3		'51	'48	Unknown
17.	Mrs. Q.	1951	44	2 years	+++	++	Extensive	Absent	+	8.0				Necropsy
18.	Mrs. R.	1952	56	8 years	+++	+++	Absent	Absent	-	2.1		'52		Alive 1957
19.	Mrs. S.	1953	56	?	+++	+	Present	Absent	+	15.8	'53	'52		Necropsy 1956
20.	Mrs. T.	1953	66	7 years	+++	-	Absent	Present	-? -	13.0		'53		Necropsy 1953
21.	Mrs. U.	1953	66	5 years	+++	+++	Present	Absent	+	3.2	'52		'52	Unknown
22.	Mrs. V.	1953	69	3 years	+++	+++	Absent	Absent	-	5.4				Necropsy 1953
23.	Mrs. W.	1953	42	13 years	+++	++	Absent	Absent	Removed	8.2	'52	'54		Unknown
24.	Mrs. X.	1955	50	6 years	+++	+++	Absent	Absent	Removed	22.8	'50		'50	Alive 1957
25.	Mrs. Y.	1955	46	7 years	+++	+++	Absent	Absent	+	4.7		'55		Alive 1957
26.	Mrs. Z.	1955	49	2 years	+++	+++	Absent	Absent	+	10.9		'55		Necropsy 1955
27.	Mrs. A. A.	1955	47	?	+++	+++	Absent	Absent	+	3.7		'55		Necropsy 1957
28.	Mrs. A. B.	1955	36	1 year	++	++	Absent	Absent	+	2.9		'55		Alive 1957
29.	Miss A. C.	1956	19	1 year	-	-	Absent	Absent	+	0.9	'55		'55	Alive 1957
30.	Mrs. A. D.	1956	31	3 years	+	+	Absent	Absent	-	3.9		'56		Alive 1957

(1) Liver biopsy done elsewhere; sections reviewed at U.M.H.

(2) Liver biopsy done U.M.H.

(3) Cholangiogram elsewhere; reports made available to U.M.H.

(4) Cholangiogram done at U.M.H.

*Unknown after 1947

**Details of terminal illness unknown

antecedent admission to the psychiatric ward at this hospital nine years before the apparent onset of disease. Only one patient used alcohol in any significant amount, the patient described as Case 16. She drank rather heavily during the three years before she was observed here, but the disease was well advanced and the diagnosis had been established by studies that included biopsy and cholangiogram at another hospital even before that period.

The physical findings of chief significance are listed in Table 1. Since all patients had enlarged livers, this physical sign has not been included. In the majority of instances the spleen was palpable. Skin pigmentation existed in all but two patients (Cases 28 and 29). These were young women and were presumed to be in the very early stages of the disorder. The degree of this melanosis varied; as shown in the table, it was quite striking in four patients. Among patients with advanced disease, the skin, particularly over the lower extremities, was frequently thick and resembled leather. This condition probably resulted from long lasting pruritus, since scratch marks and excoriations were commonly noted. All of the skin changes in this form of cirrhosis have been well described in the literature; most of the patients in this series exhibited some or all of the characteristic features that have been mentioned. Xanthomata or xanthelasma was present in only 5 of the 30 women in this series. This skin lesion has received more comment and attention in descriptions of this disease than almost any other single symptom. The clear-cut correlation between the occurrence of xanthomatous deposits in the skin and the level of the blood lipids has been well documented by the studies of Ahrens, Payne, Kunkel, Eisenmenger, and Blondheim⁶ in the series of cases studied in New York City. The patient in Case 17 of this series was the only woman with extensive xanthomata, to the degree that her disorder warranted the designation "xanthomatous biliary cirrhosis." The levels of serum cholesterol (1108 mg./100 ml.) and blood lipid (198 units) were the highest observed in the series. This unfortunate patient, also a victim of severe Raynaud's disease, had every classic feature of cholangiolitic cirrhosis: pruritus, pigmentation, jaundice, widespread xanthomata, and an enlarged liver and spleen. The patient died a year later; the diagnosis of primary biliary cirrhosis was confirmed at autopsy (see Table 4). Five other patients exhibited xanthelasma or xanthomata to a much lesser degree.

When first admitted, most of the patients appeared surprisingly healthy. The only one who exhibited ascites (Case 20) died four weeks after entering the hospital. Some of the patients who could

be followed through repeated admissions revealed a slowly changing picture, later demonstrating signs of ascites and other evidences of liver failure. Eleven of the 14 patients known to have died had had ascites terminally.

Twenty-seven of the patients were icteric when first studied. The patients in Cases 1, 11, and 29 (Table 1) had normal serum bilirubin levels. Of these, the first two women (Cases 1 and 11) had suffered gastrointestinal hemorrhages a few weeks before admission, and blood loss anemia may have influenced the serum bilirubin level. The only explanation tenable in the third (Case 29) is that the disease was still in an early stage. These three patients showed significant bromsulphalein (B.S.P.) dye retention at the time of their initial admission. In general, there is some correlation between the duration of the disease and the depth of jaundice. On subsequent admissions, many of the patients exhibited higher bilirubin values than those recorded in Table 1. The influence of certain therapeutic agents known to influence the level of the serum bilirubin must be considered. None of the patients in this series was receiving steroid agents at the time the determinations listed in Table 1 were made. Mrs. X. (Case 24) had received methyl testosterone to relieve her intense pruritus; the high value for the serum bilirubin (22 mg./100 ml.) was undoubtedly related, in part at least, to the characteristic effect of that agent in patients with cholangiolitic cirrhosis.

Biochemical Aspects

For the preliminary report on this series of cases only the *initial* laboratory values secured have been selected for incorporation in Table 2. The estimated duration of the disease has been repeated in Table 2 for purposes of orientation. Because of the disease's remarkably long duration, the results of any one set of laboratory tests merely reflect the particular phase that then exists.

The influence of any type of intrahepatic cholestasis on the liver tests currently used in clinical practice are well known. The serum bilirubin, alkaline phosphatase, and cholesterol levels are elevated. In the "pure" form of the disorder, as for example in a drug sensitivity reaction to chlorpromazine, the serum proteins and the tests for protein abnormalities (cephalin cholesterol flocculation, thymol turbidity, and zinc turbidity) are characteristically normal. The results of such tests in cholangiolitic hepatitis and cirrhosis often reflect the mixed pathological process that exists, i. e., intrahepatic cholestasis plus parenchymal cell damage. Abnormalities in the protein tests are

TABLE 2
INITIAL LABORATORY TESTS PERFORMED DURING FIRST
U. OF M. HOSPITAL ADMISSION

Case No.	Estimated Duration of Disease	Serum Bilirubin		CHOLESTEROL			Total Lipid (Units) †	Phosphatase (Units)	BILE ACIDS mg./100 ml. **		PLASMA PROTEIN			Ceph. Chol. Floc. (24 hr)	Thymol Turbidity	Zinc Turbidity
				Tot.	Ester	Ester % of Tot.					Tot.	Alb.	Glob.			
		1'	Tot.	Tot.	Ester	% of Tot.			Pt.	Contr.	Tot.	Alb.	Glob.			
1.	4 years	0.4	0.7	193				73 (K. A.)	1.2	1.0	6.6	3.2	3.4	4 +		
2.	8 years	1.1	2.0	281				38 (Bod.)	3.2	1.2	7.8	3.9	3.8	0		
3.	6 years	2.3	4.1	176	113	63%		17 (Bod.)			6.6	3.4	3.0	1 +	4	
4.	? years	1.3	2.6	382	38	10%		20 (Bod.)			9.1	4.1	4.8	3 +	12	
5.	4 years	0.4	0.7	298	95	31%		37 (Bod.)	0.4	0.4	7.2	4.5	2.6	1 +	6	
6.	7 years	1.7	2.7	406	256	62%		50 (Bod.)	3.0	0.7	6.8	3.8	3.0	0	5	
7.	7 years	8.3	13.6	434	147	34%		42 (Bod.)						0	11	
8.	1 year	2.4	5.1	384	231	60%		26 (Bod.)	2.1	0.8	6.4	3.6	2.8	2 +	7	
9.	5 years	3.1	5.5	244	147	60%		9 (Bod.)			7.4	4.0	3.4	0	4	
10.	1 year	5.9	10.0	664	120	18%	110	18 (Bod.)	2.6	0.9	8.1	3.9	4.2	1 +	9	
11.	? years	0.5	0.7	237	155	65%	40	10 (Bod.)	1.8	0.8	6.6	2.7	3.9	0	16	10
12.	4 years	2.2	4.2	258	180	70%		8 (Bod.)	1.0	0.9	6.9	2.1	4.8	0	7	9
13.	7 years	2.0	2.9					11 (Bod.)			6.1	2.3	3.8	0	1	19
14.	5 years	4.7	8.9	268	148	60%	33	12 (Bod.)	2.9	0.8	6.1	2.7	3.4	0	3	8
15.	1 year	2.8	5.8	312	150	48%		10 (Bod.)			7.3	2.1	5.2	2 +	15	33
16.	13 years	3.0	5.3	442	203	46%	60	78 (K. A.)			7.6	2.8	4.8	0	7	16
17.	2 years	4.2	8.0	1108	168	15%	198	68 (K. A.)	4.2	0.9	6.6	2.1	4.5	0	9	12
18.	8 years	1.1	2.1	232	157	68%	31	43 (K. A.)			8.2	3.5	4.7	3 +	14	7
19.	? years	9.6	15.8	411	104	25%		88 (K. A.)			6.8	3.1	3.7	2 +	5	
20.	7 years	7.2	13.0	255	21			60 (K. A.)			5.4	1.5	3.9	2 +	11	
21.	5 years	1.7	3.2	300	204	68%	26	48 (K. A.)	2.7	1.0	6.9	3.2	3.7	0	8	13
22.	3 years	3.3	5.4	410	264	64%	56	50 (K. A.)			7.8	3.3	4.5	0	10	12
23.	13 years	4.5	8.2	362	164	45%	40	55 (K. A.)			8.6	2.7	5.9	3 +	5	
24.	6 years*	13.8	22.8	276	70	25%	26	85 (K. A.)			7.3	3.6	3.7	0	16	
25.	7 years	2.5	4.7	302	51			45 (K. A.)			7.1	3.1	4.0	2 +	12	25
26.	2 years	5.8	10.9	518	94	18%	78	77 (K. A.)			6.9	2.5	4.4	1 +	7	
27.	? years	1.3	3.7	249	185	74%	25	81 (K. A.)			7.1	3.2	3.9	3 +	11	
28.	1 year	2.0	2.9	332	207	62%	58	65 (K. A.)			8.8	2.6	6.2	4 +	18	
29.	1 year	0.3	0.9	237				44 (K. A.)			8.3	3.8	4.5	0	5	14
30.	3 years	2.4	3.9	392				60 (K. A.)			7.1	2.8	4.3	4 +	8	14

* Patient had received methyl testosterone for one year.

† Method of Kunkel—normal range 18 to 30 units.

** Method of Josephson.

therefore not uncommon. As the structural alterations in the liver become more marked, the level of the serum bilirubin tends to rise, and that of the blood cholesterol declines. The alkaline phosphatase values often remain markedly elevated even in the very late stages. As signs of liver insufficiency develop, albumin levels in the serum decline, and results of tests such as the cephalin cholesterol flocculation reaction and thymol turbidity become more abnormal.

The serum bilirubin values presented in Table 2 demonstrate the wide range of levels encountered when these patients were first studied. Duration of the disease and the influence of antecedent drug therapy have already been mentioned. Sera of patients with cholangiolitic cirrhosis are not turbid despite a markedly elevated lipid and cholesterol content. Such abnormalities of the serum lipids in this disorder have been well described by Ahrens *et al.*⁶ Only two patients in the current group had cholesterol values below 225 mg./100 ml. Eight patients had cholesterol values greater than 400 mg./100 ml. Only three of the latter exhibited xanthelasma or xanthomata. Despite serum cholesterol values greater than 500 mg./100 ml., two patients (Cases 10 and 26) did not show striking xanthomatous changes at this particular time. There is no reason, however, to doubt the observations that *prolonged* elevation of the serum cholesterol in this or in cholangitic (secondary biliary) cirrhosis eventually leads to the development of xanthelasma and xanthoma. Elevations of the alkaline phosphatase were noted on the first examination in 25 patients as shown in Table 2. Bile acid determinations were not routinely performed on all of these patients at the time of their first hospital admission. The values presented in Table 2 show elevated levels in the majority of instances where the determination was carried out. The exact relationship between pruritus and the level of the bile acids has never been clearly defined, and unfortunately, the number of observations in this series is too small to draw any conclusion in this regard.

The plasma protein values on the initial examination in these patients reflected, in general, the relatively satisfactory function of the parenchymal cells of the liver that then existed. Hyperglobulinemia — so frequently encountered in young females with an idiopathic type of postnecrotic cirrhosis — was not seen with any frequency in cholangiolitic cirrhosis. In six of the patients in this series, values of the serum globulin were greater than 4.5 Gm./100 ml. on this initial determination; the highest value was 6.2 Gm./100 ml. As might be anticipated, the patients with elevated globulin levels were more

apt to show abnormal results for the cephalin cholesterol flocculation test, the thymol turbidity, and the zinc turbidity tests; the correlation was not remarkable.

The results of laboratory tests in women with cholangiolitic cirrhosis, reflecting as they do the intrahepatic obstruction of the outflow of bile, are not diagnostic in themselves. But their general pattern can be helpful in distinguishing other types of cirrhosis in women. Alcoholic females, in whom cirrhosis that is primarily fatty in nature develops, show quite a different pattern. In postnecrotic cirrhosis, at least among women in the 20 to 40 age range, the results of the liver tests also differ from those seen in cholangiolitic cirrhosis. Liver tests are, however, of little if any help in distinguishing secondary from primary biliary cirrhosis, since the patterns may very well be identical.

Pathology

The pathological changes that develop in the liver during the gradual transition of this disorder from a stage termed "hepatitis" to the late stage "cirrhosis" have been clarified during the past decade. This has come about through the opportunity to study biopsies secured in the relatively early stages, before the architecture of the liver is completely distorted. MacMahon³ has described the early abnormalities that can be identified. These are a nonspecific inflammatory reaction in the portal and periportal areas associated with evidence of bile stasis and ductular proliferation. The inflammatory reaction and its associated fibrosis are not limited to the portal areas but in an irregular fashion also involve other areas in the parenchyma. The inflammation surrounds the perilobular and the intralobular ductules, i. e., the cholangioles. The manner in which this pericholangiolitic reaction can produce a cylindrical network of fibrous tissue that traverses but does not dissect a lobule has been described by Popper and Elias.⁴ The three-dimensional approach employed by these investigators aids greatly in enabling one to understand how the pericholangiolitis initially produces a pseudo-cirrhosis. The lobular pattern is not actually destroyed or even greatly distorted, and nodular regeneration does not appear until a very late stage of the disorder. Its early stages are characterized by a proliferation of bile ductules which later becomes inconspicuous. In the final stage the microscopic picture grows increasingly complex, and the disease, frequently indistinguishable from other types of cirrhosis, often receives the designation "portal."

The biopsy specimens available from 27 of the 30 patients de-

scribed in this report have been reviewed by the writer. The entire set of slides in the collection has not as yet been studied in detail by an individual pathologist. The cases chosen for this report have been selected on the basis of clinical data and not on the basis of a uniform pathological diagnosis at the time of hospitalization. No patient was included if the pathology demonstrated by biopsy or later at autopsy was obviously incompatible with a diagnosis of cholangiolitic hepatitis or cirrhosis. The tissue specimens from these patients have been examined in the routine hospital fashion by a number of pathologists in the twelve-year period covered by this study. The terminology employed by the hospital pathologists to describe the changes in the liver varied widely. This lack of uniformity is not surprising when one remembers that the descriptions of the histopathology seen in the early stages of the disease were just appearing in the medical literature during this era.

A pathological diagnosis of "cirrhosis" was submitted for 21 of the 27 biopsy specimens. This was often termed "portal" or "early" cirrhosis, in some instances other qualifications were added. The pathologist indicated that in each of the 21 specimens architectural distortion was sufficient to warrant a diagnosis of cirrhosis, even if he did not further classify it as biliary, pericholangiolitic, or cholangiolitic. In no instance was fatty infiltration or any other finding noted that would indicate some specific type of recognizable cirrhosis, such as hemochromatosis. The impossibility of classifying many examples of cirrhosis solely on the basis of the histological appearance is clearly recognized and must be accepted.

In the remaining six of the 27 instances the pathologists who examined the specimens did not feel that the designation cirrhosis was warranted. These six liver biopsies were from the patients described in Cases 18, 24, 25, 28, 29, and 30, all of whom are alive at present. In four instances the typical features of pericholangiolitis existed and a diagnosis of cholangiolitic hepatitis was acceptable (Cases 24, 25, 29, 30). The biopsy specimens from the two other patients (Cases 18 and 28) showed atypical features. The specimen from the patient in Case 18, secured in 1952 (estimated as the eighth year of her disease), showed preservation of the liver architecture. An increased number of lymphocytes in the portal space and an increased amount of bile pigment were present in the liver cells. There was no increase in fibrous tissue; proliferation of bile ductules was not conspicuous. In the parenchyma, small collections of lymphocytes, plasma cells, and other mononuclear cells formed granuloma-like structures with

no specific characteristics. The biopsy was secured at the time of an operative cholangiogram and common bile duct exploration; extrahepatic biliary obstruction was excluded,* and the pathological diagnosis was biliary stasis of the liver. The biopsy specimen from the patient listed as Case 28 was obtained at laparotomy in 1956 in the first year of the illness. The outstanding histologic abnormality was a heavy lymphocytic infiltrate, predominantly in the portal spaces but to a lesser extent scattered throughout the parenchyma; fibrosis was absent. The pathologist's diagnosis was "liver with lymphocytic infiltrate." **

Of the entire group, seven patients are living, 14 are known to be dead, and the outcome in nine cases is unknown. Autopsy information is available in ten cases; these data are presented in Table 3. The causes of death and the pathologic findings are not unusual except in one instance, Case 12. Microscopic examination of tissues secured at autopsy after the patient's death in January, 1957, disclosed an intense iron pigmentation of the hepatic cells. The liver revealed the pattern of a postnecrotic cirrhosis, and iron deposition in the scarred areas was negligible. The pancreas also had a heavy parenchymal accumulation of iron pigment; the islets were normal; peripancreatic nodes contained iron. The spleen was hyperplastic and fibrotic; iron was present in focal deposits. The patient had been subjected to a porto-caval shunt operation on February 1, 1956, during which inspection and palpation showed that the liver was cirrhotic. An adequate liver biopsy secured at that time revealed a pattern that was consistent with the diagnosis of postnecrotic cirrhosis; no excess iron was demonstrable even by special stains. The case is considered unique in the experience of the pathologists at this hospital.

Discussion

The purpose of this preliminary report is to discuss the experience at the University of Minnesota Hospitals with chronic cholangiolitic hepatitis and cholangiolitic cirrhosis during the past 12 years. The case review is still incomplete: as Table 1 indicates, data on the ultimate outcome are lacking for one-third of the group. Some information on the clinical course of ten of the thirteen patients known to be dead can be derived from Table 3. As yet no information is avail-

*The patient is under observation at present. She is in good health, exhibits moderate pigmentation of the skin, and is only mildly disturbed by pruritus. Jaundice is absent; the alkaline phosphatase remains elevated (39 King-Armstrong units) and there is B.S.P. retention (29%).

**This patient is under observation. Slight icterus persists. Skin pigmentation is minimal and pruritus is relatively mild. The liver and spleen are both palpable.

TABLE 3
 NECROPSY FINDINGS IN TEN CASES OF
 CHOLANGIOLITIC CIRRHOSIS

Case No.	Estimated Duration of Disease (Total)	Age at Death	Liver	Spleen	Varices	Ascites	Common Bile Duct	Pathologist's Diagnosis	Cause of Death
1	6 years ('39-'45)	54	1950 gm.	460 gm.	Present	Minimal	Normal	Portal Cirrhosis	Bleeding esophageal varices
2	16 yrs. ('37-'53)	47	1700 gm.	80 gm.	Present	Present	Normal	Cirrhosis, probably postnecrotic type	Hepatic failure and bleeding varices
7 (a)	10 yrs. ('41-'51)	50	1480 gm.	Splenectomy-1948	—	—	Normal	Biliary Cirrhosis Hanot type	Hepatic failure
12 (b)	11 yrs. ('46-'57)	62	—	250 gm.	—	Present	Normal	Postnecrotic cirrhosis; hemochromatosis	Hepatic failure
17 (c)	3 yrs. ('50-'52)	45	—	—	—	—	Normal	Biliary Cirrhosis, xanthomata, cutaneous and reticuloendothelial	Hepatic failure
19 (d)	? (Died-'56)	59	2240 gm.	360 gm.	Absent	Absent	Normal	Biliary Cirrhosis	Gastric Ulcer with Hemorrhage
20	7 yrs. ('46-'53)	66	1550 gm.	560 gm.	Present	Present	Normal	Biliary Cirrhosis	Hepatic failure
22	3 yrs. ('50-'53)	69	1800 gm.	250 gm.	Absent	Absent	Normal	Cirrhosis, early (type not specified)	Coronary thrombosis and myocardial infarction
26	2 yrs. ('53-'55)	49	2650 gm.	650 gm.	Present	Minimal	Normal	Cirrhosis (type not specified)	Carcinoma of cervix; hepatic and renal failure (post-operative)
27	? (Died-'57)	47	2540 gm.	900 gm.	Present	Absent	Normal	Cirrhosis (type not specified)	Bleeding esophageal varices

(a)—Reported by courtesy of Dr. B. F. Mann, Jr., Fairfield, Ala.

(b)—Reported by courtesy of Dr. G. E. Lee, Glenwood, Minn. & Dr. Robert Hebbel, Minneapolis, Minn.

(c)—Reported by courtesy of Dr. S.M.P. Asche, Denver, Colo.

(d)—Reported by courtesy of Dr. Kano Ikeda, St. Paul, Minn.

THE MEDICAL BULLETIN

able on the terminal illness of two of the three patients who have died but were not subjected to necropsy. Mrs. J., described as Case 10 (Table 1), exhibited deep jaundice and ascites during the final year of her illness and expired in hepatic coma after an illness of eight years. For the patients listed in Table 3, the natural course of the disease lasted from 3 to 16 years. The shortest life-span after the onset of the disease — 3 years — was that of Mrs. Q. (Case 17), who, as previously mentioned, presented the classical features of xanthomatous biliary cirrhosis. In two patients (Cases 22 and 26) the natural course of the disease was interrupted by other disorders. Mrs. V. (Case 22) in the third year of her disease at age 69 died of coronary thrombosis and myocardial infarction as demonstrated at necropsy; she is the only patient in the series known to have died of a coronary thrombosis. In fact, according to Popper,⁷ atherosclerosis is not more severe in patients with cholangiolitic cirrhosis than in normal persons. Mrs. Z. (Case 26) died in 1955 at the age of 44. The duration of liver disease was estimated to be 2 years. While under observation and treatment for cholangiolitic cirrhosis, the patient was found to have a cancer of the uterine cervix. She died of hepatic and renal failure while under treatment for the gynecological disease. The apparently short duration of her liver disease may represent an error in estimating the onset, since clinical observations and autopsy findings suggest that the disease had existed earlier.

The status of the seven patients known to be alive at this time is described in Table 4. Two of the patients are virtual invalids (Cases 5 and 24), the duration of whose disease is estimated at present to

TABLE 4
STATUS (1957) OF SEVEN PATIENTS KNOWN TO BE LIVING

Case No.	Age	Estimated Duration of Disease	State of Health	Comment
5	67	16 yrs.	Poor	Jaundice, emaciation and ascites present.
18	61	13 "	Good	Robust and slightly obese; slight pruritus is only complaint.
24	52	8 "	Poor	Pruritus distressing despite testosterone therapy; edema, deep jaundice and bone pain present.
25	48	9 "	Good	Mild icterus present; pruritus is distressing; GI hemorrhage March 1957, four months after splenectomy.
28	38	2 "	Good	Minimal pruritus; compression fracture vertebra (spontaneous) during cortisone therapy in 1956.
29	20	2 "	Good	Able to work (nursing); pruritus quite minimal.
30	32	4 "	Good	Minimal pruritus; currently receiving steroid therapy under care of her own physician.

be eight and sixteen years respectively. Mrs. Y. (Case 25) enjoys good health save for the annoyance of pruritus. After her first gastrointestinal hemorrhage in 1956, surgical relief for the portal hypertension was advised. The surgeon was unable to accomplish a spleno-renal shunt because of the small caliber of the splenic vein; therefore, splenectomy was performed. The patient withstood this procedure well, but she has since had one gastrointestinal hemorrhage (see Table 4). Although the patient's disorder in Case 18 appears to have existed for 13 years, the patient atypically enjoys excellent health in every respect, but abnormalities of liver function can still be demonstrated (see footnote, page 12). The period of observation for the three young women listed in Table 4 has been too short to warrant any conclusions at present.

Brief mention may be made of some of the associated phenomena that these patients exhibited in the course of their prolonged illnesses. In three patients (Case 2, 19, and 24) a distressing feature of the late stage of the disease was severe bone pain due to osteomalacia. Paget's disease was at first suspected in the patient described as Case 2; later the correct interpretation was made. All three patients experienced some relief from bone pain when the calcium and vitamin D intake was increased. (The occurrence of disturbances in calcium balance is not too surprising in view of the long diminution of bile outflow among these patients, an aspect that has recently been reviewed by Atkinson, Nordin, and Sherlock.⁸)

Three of the patients (Cases 9, 19, and 22) had rheumatoid arthritis prior to the onset of the disease. In each instance the well-known ameliorating effects of obstructive jaundice on the symptoms of arthritis became apparent. But the patients considered the development of cholangiolitic cirrhosis a high price to pay for their relief from arthritis, and they said that they preferred the discomfort of arthritis to the misery of pruritus. Mild diabetes has developed in two of the patients in the group now living.

During the 12 years covered by this report the patients with cholangiolitic cirrhosis and hepatitis cared for at this hospital have received a variety of therapeutic measures, but no agent or combination of agents significantly influenced the ultimate course of the disease. In instances of high-grade biliary obstruction, vitamins A, D, and K were helpful, as were other supportive measures. Sodium restriction was enforced when edema or ascites was present. Bile salts were not administered because of the fear of aggravating the pruritus.

To control itching a number of agents were employed. Lotions, antihistaminic drugs and sedatives usually proved ineffectual. Ergotamine was seldom used because it presents inherent dangers and offers only temporary relief. Five patients received methyl testosterone orally. In one instance (Mrs. X., Case 24) the patient was already taking this agent when she was first seen here. The other four patients (described in Table 1 — Cases 22, 23, 26, and 27) received methyl testosterone after all other measures failed to give relief from itching. These patients and their referring physicians were informed that an intensification of the jaundice and an increase in the tendency to form ascites and edema would be likely to occur. The patients all became more icteric but usually obtained relief from itching while receiving this agent, in accord with the experience of others.^{2,9}

Varco¹⁰ demonstrated that external biliary drainage will relieve pruritus in patients with cholangiolitic cirrhosis, describing in his report the patient listed as Case 2 in this series. The patient listed in Table 1 as Case 6 also had external biliary drainage instituted, but ultimate effect was unknown because the patient lived in South America and no follow-up information was available. The problems inherent in external drainage of bile by T-tube or catheter are formidable, since the tube must be kept in place for several years at least. It was not employed in any of the cases of this series admitted to this hospital after 1947. The patient presented in Table 1 as Case 24 had had external biliary drainage instituted at another hospital, but the procedure was abandoned after several years because of infection at the drainage site. Pruritus promptly recurred, and methyl testosterone treatment was instituted by the patient's physician as mentioned above.

In 1952 Williams and Flink¹¹ presented observations on corticotropin (ACTH) therapy in chronic liver disorders. Three patients included in the present report (Cases 2, 10, and 14) were among the eight studied. Temporary relief of pruritus was noted, but the untoward side effects — fluid retention and hemorrhage from esophageal varices — proved too dangerous to warrant the continued administration of ACTH. The three youngest patients in the present series (Cases 28, 29, and 30) have received trials of steroid therapy, instituted with the hope that the disease might be partially inhibited or controlled. Mrs. A. B. (Case 28) developed severe back pain due to a compression fracture of a vertebra after receiving prednisone for three months. The drug was promptly discontinued. It is difficult to state whether or not the course of the disease has been altered;

reduction in the degree of splenomegaly was the only objective change observed. Steroid therapy was also discontinued after a three-month trial in Miss A.C. (Case 29), whose physician was not convinced that any beneficial effects resulted from its use. The patient described in Case 30 (Mrs. A.D.) is currently receiving a trial of steroid therapy under the supervision of her physician; the results have not yet been evaluated.

Two patients with cholangiolitic cirrhosis have undergone portocaval shunts at the University Hospitals during this period. Miss C. (Case 3) was operated upon in 1946 and Mrs. L. (Case 12), in 1956. In both instances the operation was followed by a striking increase in the depth of jaundice. In the first patient, the total serum bilirubin rose from 5 to 48 mg./100 ml. by the fourth postoperative day. The second patient's serum bilirubin rose from 4.5 to 38 mg./100 ml. by the fourth day. Miss C. survived a stormy postoperative course but experienced further gastrointestinal hemorrhages during the following year; her eventual outcome is unknown. Mrs. L. survived one year; her case is described in Table 3.

Summary

No definite conclusions can be drawn from the series of observations in this report. It is doubtful that any can be drawn even after the study has been completed and the outcome of the earlier cases determined. Because of the rarity of this chronic disorder, an individual physician can seldom observe its natural history in more than a few instances. There is no conclusive evidence that the disease in the patients just described represents a single entity, despite the similar clinical findings exhibited by many of them. Nearly all students of the disease have observed that it occurs most commonly in adult females. The age of onset in 26 of the 30 women just described was estimated to be less than 40 years in eight instances, between 40 and 60 years in 15 cases, and beyond 60 years in three cases. No clear-cut relationship to menses, to pregnancy, or to the menopause was evident.

The existence of this disorder can be suspected on the basis of the characteristic symptoms of fatigue and pruritus and the physical signs of pigmentation of the skin and enlargement of the liver. It should be emphasized that detectable jaundice may not develop until some time after the onset of the disease. A pathological diagnosis can usually be established during life if an adequate liver biopsy specimen can be obtained. The earliest lesion that can be recognized is a peri-

cholangiolitis associated with bile ductule proliferation, and the pathological findings in the liver become increasingly complex as the disease advances.

The etiology of the disease is unknown. In the majority of instances the disorder once established appears to be relentlessly progressive. The late stages are characterized by evidences of portal hypertension and hepatic insufficiency. At present, no specific remedies are known; treatment must be symptomatic and supportive.

The author acknowledges the assistance of Dr. Charles Metzler and Dr. Gerhardt Mack in a review of some of the hospital records in this series of cases.

REFERENCES

1. Netter, F. H.: *A compilation of Paintings on the Normal and Pathological Anatomy of the Digestive System; Part III Liver, Biliary Tract and Pancreas*, E. Oppenheimer, Editor. Ciba Collection of Medical Illustrations, Vol. 3. Summit, N. J., 1957 (p. 97).
2. Kunkel, H. G.: "Biliary Cirrhosis," (pages 467-487) in *Diseases of the Liver*, Leon Schiff, Editor. J. B. Lippincott Co., Philadelphia, 1956.
- 3a. MacMahon, H. E.: Biliary Xanthomatosis (Xanthomatous Biliary Cirrhosis). *American J. of Path.* 24:527-533 (May) 1948.
- b. MacMahon, H. E. & Thannhauser, S. J.: Xanthomatous Biliary Cirrhosis (A Clinical Syndrome). *Ann. Int. Med.* 30:121-179 (Jan.) 1949.
- c. MacMahon, H. E. & Thannhauser, S. J.: Congenital Dysplasia of the Interlobular Bile Ducts with Extensive Skin Xanthomata: Congenital Acholangic Biliary Cirrhosis. *Gastroenterology* 21:488-506 (Aug.) 1952.
4. Popper, H. and Elias, H.: Histogenesis of Hepatic Cirrhosis Studied by Three-Dimensional Approach. *Am. J. of Path.* 31:405-441 (May-June) 1955.
5. Watson, C. J. and Hoffbauer, F. W.: The Problem of Prolonged Hepatitis with Particular Reference to the Cholangiolitic Type and to the Development of Cholangiolitic Cirrhosis of the Liver. *Ann. Int. Med.* 25:195-227 (Aug.) 1946.
6. Ahrens, E. H., Payne, M. A., Kunkel, H. G., Eisenmenger, W. J., Blondheim, S. H.: Primary Biliary Cirrhosis. *Medicine*: 29:299-364 (Dec.) 1950.
7. Popper, Hans and Schaffner, Fenton: *Liver, Structure and Function* (pp. 460-467). McGraw-Hill, New York, 1957, 777 pages.
8. Atkinson, M., Nordin, B. E. C., and Sherlock, S.: Malabsorption and Bone Disease in Prolonged Obstructive Jaundice. *Quart. J. Med.* 25:299-312 (July) 1956.
9. Lloyd-Thomas, H. G. L., Sherlock, S.: Testosterone Therapy for the Pruritus of Obstructive Jaundice. *Brit. Med. J.* 1289-1295 (Dec.) 1952.
10. Varco, R. L.: Intermittent External Biliary Drainage for Relief of Pruritus in Certain Chronic Disorders of the Liver. *Surgery* 21:43-45 (Jan.) 1947.
11. Williams, C. F. and Flink, E. B.: Corticotropin Therapy of Chronic Liver Diseases. *J. Lab. and Clin. Med.* 39:888-895 (June) 1952.

Editorial

Harold S. Diehl, Dean

As school opens this fall, the big news, of course, concerns Dean Diehl, who has advanced his retirement from the compulsory date of June, 1960, to some as yet undetermined date within the next year or so. He has accepted, beginning November 1, a most important post with the American Cancer Society, a post that will permit him to contribute significantly to American medicine for several years beyond the time when retirement from the University would have been necessary. During the coming year he will divide his time, serving both the Cancer Society and the University.

The unanimous reaction of members of the Faculty to the announcement of the Dean's plans was at first shocked disbelief, then genuine regret at the prospect of losing the services of the man who has given our School such outstanding leadership for nearly a quarter of a century. For most of us it has been just about impossible to imagine the Medical School without Dr. Diehl at the helm.

The *Minneapolis Star* noted this development at our institution in an editorial headed "A Great Dean." We can think of no better description of Dr. Diehl than this simple, meaningful phrase.

Why has he been a great dean? How has he been able to preside so successfully over the fortunes of the Medical School during a period of remarkable development and expansion, a period of momentous changes in medicine, a period in which Minnesota took its place among the nation's finest medical schools?

We are sure Dr. Diehl would be first to admit that a dean's success, like that of a football coach, depends to a very large extent upon his "material," the quality of the "players" on his team. But unlike a football coach, a dean, because he is seeking the services of avowed professionals, may recruit actively and openly. Chance does not determine a dean's "material," rather he himself bears the final responsibility for selecting his own "players." Dr. Diehl has demonstrated an uncanny ability to select the right people. This ability is evidenced by the frequency with which his advice is sought concerning appointments in other schools.

Having selected outstanding persons as faculty members, Dr. Diehl has perhaps been at his very best in his dealings with them, in "keeping them happy." Always patient and at least outwardly imperturbable, he gives a careful hearing to any staff member who wishes to

state his views. His decisions are reached only after consideration of all available evidence and all viewpoints. Consider, for example, how he deals with requests for funds and facilities from the various departments. These are almost always individually reasonable and justifiable, yet usually their total exceeds available resources. This disparity between requests and available funds the dean has regularly reconciled solely on the basis of what would best serve the overall objectives of the Medical School. What is more, he has been able to make clear to all faculty members concerned the sound reasons for his decisions. The head of one major department recently described this quality well: "One of Harold Diehl's great strengths," he said, "lies in the fact that he has been neither a 'yes man' nor a 'no man.' He does not promise or appear to promise everything to everybody, nor does he oppose things just as a matter of general principle. His dealings with his faculty have always been open and extremely fair."

His comprehensive understanding of medical education is, of course, to be expected and scarcely requires comment. But what is worthy of special mention is Dr. Diehl's sharp awareness that a most important mark of a good physician is his knowledge of the basic medical sciences together with the ability to apply their principles to his practice. As a result, basic science departments have received his strong support and have thrived during his tenure as Dean.

The *sine qua non* of a medical school is, of course, the medical student. A good dean must understand his students, know their needs, motivations, interests. During his years of service to the Medical School, students have known him as friend and wise counselor.

A successful dean must also thoroughly understand all aspects of financing his institution; he must know possible sources of funds and be persuasive in marshaling support. Dr. Diehl has proved himself to be without a peer in this aspect of medical school administration.

Still other qualities have contributed to Dr. Diehl's success as a dean, qualities that are less definable than the foregoing. Dignity, warmth, human understanding, a sense of humor are all attributes which he possesses in rich supply, and without which he could not have been nearly so effective. The Dean's good health and boundless energy, and the help of his charming, understanding wife have also been essential. Renowned and respected nationally and internationally, Dean Diehl has caused his influence and that of the Medical School to be felt in widespread areas of the world. For many, many years to come, we are sure, the words "the Dean" will evoke among his host of medical friends only one image — that of Harold S. Diehl.

Minnesota Medical Foundation

Minnesota Medical Foundation Day

Monday, September 30, the opening day of school, was Minnesota Medical Foundation Day. Activities began at 11:00 a.m. in the Mayo Memorial Auditorium when DR. WESLEY W. SPINK, Foundation President, presented scholarships to the following medical students:

Freshmen

WILLIAM C. CONRAD, St. Paul	HENRY MOELLER, Vermillion, S. Dak.
GEORGE G. HABERMAN, Osakis	GERALD SCHLOSSER, Madison
GERALD MINDRUM, Minneapolis	ROBERT E. WAHMAN, St. Paul

Sophomores

DONOVAN L. BECKMAN, Minneapolis	DAVID S. HOPKINS, El Paso, Texas
WILLIAM L. CHRISTIAN, Adrian	ROBERT E. KALINA, Montgomery
DALE EICHELBERGER, Murdock	ELLIOTT RUSTAD, Lanesboro
WENDELL G. GEARY, Pemberton	NORMAN P. WIGG, Duluth
ELIZABETH M. HAALAND, Fairfax	CONRAD J. WILKOWSKA, Owatonna

Junior

DALE L. ANDERSON, Austin	RAYMOND M. MARTINSON, Eveleth
JOHN B. CAMPBELL, Virginia	GERALD F. TUOHY, Chatfield
ROBERT T. DALE, Minneapolis	ELMER W. YLITALO, Minneapolis
JACK O. HUBBARD, Minneapolis	

Senior

EVERETT P. DULIT, Brooklyn, New York

All awards were based on both scholarship and need. The grant to Raymond M. Martinson was for \$800; all others were for \$500 each.

Several of the above scholarships were specifically contributed by the following organizations: Minnesota Academy of General Practice (William L. Christian); Minneapolis Chapter, American Academy of General Practice (Elmer W. Ylitalo); Minnesota Academy of Medicine (Donovan L. Beckman); Minneapolis Guild of Catholic Physicians (Gerald F. Tuohy); and Minneapolis Society of Internal Medicine (Jack O. Hubbard). Other contributors to the Scholarship Fund included: Nicollet-LeSueur County Medical Society, Kandiyohi-Swift-Meeker County Medical Society, Minnesota Surgical Society, Interstate Clinic of Red Wing, and Nu Sigma Nu Medical Foundation.

Following presentation of the scholarships the annual Minnesota Medical Foundation Day Lecture was given by DR. DANA W. ATCH-

THE MEDICAL BULLETIN

LEY, Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons, and Visiting Physician, Presbyterian Hospital, New York City, whose topic was, "The Physician as Scholar and Humanist." Dr. Atchley's stimulating address was warmly received by students, faculty members, and visitors.

Another feature of Minnesota Medical Foundation Day was the presentation of an Outstanding Achievement Award to DR. HENRY W. WOLTMAN, '13, *Emeritus Professor* of Neurology, Mayo Foundation, Rochester. The citation accompanying the Award described Dr. Woltman as "acknowledged authority on the subject of neuritis and pernicious anemia, lauded for the high ethical standards to which he has always adhered, revered as a gentle and beloved teacher by countless students."

Following the exercises in the Auditorium, the annual membership meeting was held in the Junior Ballroom of Coffman Memorial Union. Scholarship recipients and members of their families were guests of the Foundation at the luncheon. DR. ROBERT B. HOWARD gave the Secretary-Treasurer's report. DR. WESLEY W. SPINK, President, reviewed briefly the history of the Foundation and spoke about its objectives for the future. DEAN H. S. DIEHL gave a few brief words of thanks to supporters and friends of the Foundation.

Election of members to the Board of Trustees followed. DR. FRANCIS W. LYNCH, on behalf of the Nominating Committee, proposed the following slate: DRs. ARNOLD LAZAROW, R. S. YLVISAKER, and CHARLES E. REA, the latter for a second term.

Medical School Activities

Dean Diehl Accepts Cancer Society Post

DR. HAROLD S. DIEHL, Dean of the College of Medical Sciences since 1935, has announced that he has accepted appointment as Senior Vice President for Research and Medical Affairs, and Deputy Executive Vice President of the American Cancer Society, that organization's top medical post. He will assume his new duties on November 1. During the coming year Dr. Diehl will continue to serve the University part-time. (See editorial, "Harold S. Diehl, Dean," in this issue.)

DR. ROBERT B. HOWARD has been appointed Associate Dean of the College of Medical Sciences, effective October 1. Dr. Howard was Director of the Department of Continuation Medical Education from January, 1952, until his recent appointment.

DR. N. L. GAULT, JR., was named Director of the Department of Continuation Medical Education to succeed Dr. Howard, also effective October 1. Dr. Gault has been Assistant Dean since January 1, 1956, and will continue to carry some of the responsibilities of that position. Dr. Gault has also succeeded Dr. Howard as Editor of the BULLETIN.

New Appointments and Promotions

We are pleased to welcome the following people to the Faculty this year:

DR. K. A. EXLEY, Assistant Professor, Department of Pharmacology.

DRS. PETER F. BRIGGS and MANFRED MEIER, both Assistant Professors in the Division of Clinical Psychology.

The following members of the Faculty were promoted to professional ranks as of July 1:

Anatomy

DR. J. FRANCIS HARTMANN to Professor

DR. ANNA-MARY CARPENTER to Assistant Professor

Anesthesiology

DR. ELLIS N. COHEN to Clinical Associate Professor

Medicine

DR. EDMUND B. FLINK to Professor

DR. B. J. KENNEDY to Associate Professor

DRS. DONALD AMATUZIO, L. RAYMOND SCHERER, and J. ALLEN

WILSON to Clinical Associate Professor

DRS. JAMES B. CAREY, JR. and M. J. MURRAY to Assistant Professor

THE MEDICAL BULLETIN

DRS. PAUL J. BILKA, PAUL T. LOWRY, DEAN K. RIZER, JOSEPH M. RYAN, BEN SOMMERS, and LOWELL WEBER to Clinical Assistant Professor

Obstetrics and Gynecology

DRS. IRVING BERNSTEIN and RODNEY F. STURLEY to Clinical Assistant Professor

Ophthalmology

DR. JOHN P. WENDLAND to Clinical Associate Professor

DRS. BRUCE L. KANTAR, ROBERT H. MONAHAN, and KARL E. SANDT to Clinical Assistant Professor

Pathology

DRS. JOEL G. BRUNSON and LEE W. WATTENBERG to Assistant Professor

Pediatrics

DRS. ELEANOR COLLE and PAUL ELLWOOD to Assistant Professor

Physiology

DR. ROBERT L. EVANS to Assistant Professor

Psychiatry

DR. RICHARD M. MAGRAW to Associate Professor

DRS. WILLIAM FLEESON, G. WENDELL HOPKINS, and CARL KOUTSKY to Assistant Professor

Neurology

DR. ZONDAL R. MILLER to Clinical Associate Professor

DRS. HAROLD BERRIS, FRANK MORRELL, and DAVID WEBSTER to Assistant Professor

Clinical Psychology

DRS. HAROLD GILBERSTADT, DAVID T. LYKKEN, and DANIEL N. WIENER to Assistant Professor

Roentgen Diagnosis

DRS. JOSEPH JORGENS and CHARLES M. NICE, JR. to Associate Professor

Radiation Therapy

DR. MERLE LOKEN to Assistant Professor

General Surgery

DR. MARTIN A. NORDLAND to Clinical Associate Professor Emeritus

DRS. DAVITT A. FELDER, CONRAD I. KARLEN, BERNARD G. LANNIN, and FREDERICK M. OWENS, JR. to Clinical Associate Professor

DRS. SAMUEL HUNTER and LLOYD D. MACLEAN to Assistant Professor

DRS. MAYNARD C. NELSON and VERNON D. E. SMITH to Clinical Assistant Professor

Orthopedic Surgery

DR. EDWARD T. EVANS to Clinical Professor

DR. MALVIN J. NYDAHL to Clinical Associate Professor

DRS. FRANK S. BABB, LESTER W. CARLANDER, RICHARD H. JONES, and RICHARD REILEY to Clinical Assistant Professor

Postgraduate Education

Symposium on Skin Cancer for Dermatologists

The University of Minnesota will present a Symposium on Skin Cancer for Dermatologists at the Center for Continuation Study on the University campus from October 24 to 26, 1957. Fundamental and clinical aspects of skin cancer will be taken up in detail. Guest speakers will include DOCTORS HERMAN BEERMAN, ANTHONY CIPOLLARO, LEON O. JACOBSON, ALFRED KOPF, JOHN H. LAMB, C. FERD LEHMANN, FREDERIC E. MOHS, CHESTER M. SOUTHAM, EUGENE J. VAN SCOTT, and ASHTON L. WELSH. The Symposium will be presented under the direction of DR. FRANCIS W. LYNCH, Professor and Director, Division of Dermatology. DR. HENRY E. MICHELSON, who retired as Professor and Director of the Division of Dermatology, will be honored during the program.

Cardiovascular Radiology for Radiologists

The University of Minnesota announces a continuation course in Cardiovascular Radiology for Radiologists, to be held on the University campus from November 4 to 8, 1957. All aspects of cardiovascular radiology will be covered in detail. Guest participants will include DOCTORS ULF G. RUDHE, Acting Chief of the Roentgen Diagnostic Department of Children's Clinic, Karolinska sjukhuset, Stockholm, Sweden; DICKINSON W. RICHARDS, Director, First Medical Division, Bellevue Hospital, New York City; LEO G. RIGLER, Visiting Professor, Department of Radiology, University of California School of Medicine at Los Angeles, and Consultant and Director of Education, Department of Radiology, Cedars of Lebanon Hospital, Los Angeles; BENJAMIN M. GASUL, Clinical Professor, Department of Pediatrics, University of Illinois College of Medicine, and Director, Pediatric Cardiophysiology Department, Cook County Children's Hospital and Hektoen Institute for Medical Research, Chicago; HERBERT M. STAUFFER, Professor, Department of Radiology, Temple University School of Medicine, Philadelphia; and BERNARD J. O'LOUGHLIN, Associate Professor, Department of Radiology, and Head, Diagnostic Division, University of California School of Medicine at Los Angeles. The course will be presented under the direction of DOCTORS HAROLD O. PETERSON, Professor and Head, Department of Radiology, and JOSEPH JORGENS, Associate Professor, Department of Radiology. The remain-

ing participants will be members of the faculty of the University of Minnesota Medical School and the Mayo Foundation.

Notice

All continuation courses presented by the University of Minnesota are approved for formal postgraduate credit by the American Academy of General Practice. Attendance certificates will be furnished on request.

Further information concerning the above programs or others to be presented may be obtained by writing to Dr. N. L. Gault, Jr., 1342 Mayo Memorial, University of Minnesota, Minneapolis 14.



Coming Events

- October 24-26 Symposium on Skin Cancer for Specialists
- November 4-8 Continuation Course in Cardiovascular Radiology for Radiologists
- November 7 E. P. LYON LECTURE: *Biophysics and Neurophysiology in the Cochlea*; DR. HALLOWELL DAVIS, Director of Research, Central Institute for the Deaf, St. Louis, Missouri; Room 100, Mayo Memorial; 4:30 p.m.
- November 7 LEO G. RIGLER LECTURE: *Bullous Emphysema*; DR. DICKINSON W. RICHARDS, Director, First Medical Division, Bellevue Hospital, New York City; Mayo Memorial Auditorium; 8:15 p.m.
- November 18-20 . . . Continuation Course in Physical Medicine for Specialists
- November 27 JACK FRIEDMAN LECTURE: DR. ULF G. RUDHE, Acting Chief of the Roentgen Diagnostic Department of Children's Clinic, Karolinska sjukhuset, Stockholm, Sweden; Mayo Memorial Auditorium; 4:00 p.m.

Medical School Faculty

ADMINISTRATION

COLLEGE OF MEDICAL SCIENCES

Harold S. Diehl, Dean
Robert B. Howard,
Associate Dean
N. L. Gault, Jr.,
Assistant Dean
H. Mead Cavert,
Assistant Dean

HOSPITALS

Ray M. Amberg, Director
Gertrude M. Gilman,
Associate Director
Tomie Romson,
Assistant Director,
Manager of the Variety
Club Heart Hospital,
In charge of Service
and Supplies
Eugene Staples,
Assistant Director,
Manager of the Out-
Patient Department,
Fiscal Officer
Merle McGrath, Hospital
Fiscal Supervisor
Florence Julian, Director
of Nursing Services
Sue Kern, Assistant Director
of Nursing Services
Angeline Mannick,
Director of Nutrition
Audrey Coulter,
Administrative Dietitian
Annie Laurie Baker,
Director of Social Service
Philip W. Hursh,
Hospital Health Officer
Hallie Bruce,
Chief Pharmacist
Irene Foster, Director
of Volunteer Services
Helborg Gilbertson,
Administrative Secretary
Gerard Frawley,
Administrative Assistant
Ethel Harrington,
Personnel Officer
Bertha Pfenninger, Principal
Medical Record Librarian

ANATOMY

Arnold Lazarow,
Professor and Head
Professor Emeritus
E. A. Boyden
Hal Downey
Shirley P. Miller

Professor

J. Francis Hartmann
Lemen J. Wells

Associate Professor

Berry Campbell
R. Dorothy Sundberg
W. Lane Williams

Assistant Professor

Anna-Mary Carpenter
William J. L. Felts

Instructor

Richard M. Condie
Joseph Davidson
Carl T. Friz
Carl B. Heggstad
Sheldon M. Lagaard

Teaching Assistant

Mary Jane Buckman
Chester A. Glomski
Charles Good
Ung Kee Hwang
Arnold W. Lindall
Edwin M. Masters
Edward T. Wong
L. Austin Yates

ANESTHESIOLOGY

Frederick H. Van Bergen,
Professor and Head

Professor Emeritus

Ralph T. Knight

Clinical Associate Professor

Ellis N. Cohen

Instructor

Joseph J. Buckley
Charles F. Galway
James H. Matthews
John R. Gordon
Earl A. Schultz
Shirley J. Cedarleaf

Clinical Instructor

Russell W. Bagley
Charles W. Field
J. Albert Jackson
Arthur J. Oswald

Medical Fellow Specialist

Inge M. Theobalt

Medical Fellow

Regino V. Balce
Bernard Boecker
Edward Burleigh
Richard O. Burmeister
Skaidrite Fedders
John E. Haynes
George W. Heine
Martin Hoehn
Eleno H. Jover
William E. Kemp

Irene Kosiak
William Chae-Sik Lee
Byron D. Petersen
Dong Shik Rhee
John M. Sheehan
Bruce M. Shepard
Osmund A. Wisness
Charles M. Zeigler

BACTERIOLOGY AND IMMUNOLOGY

Jerome T. Syvertson,
Professor and Head

Professor

Herman C. Lichstein
Harold Macy
Dennis W. Watson

Associate Professor

James J. Jezeski
Carl R. Johansson
Joseph C. Olson
William F. Scherer
Edwin L. Schmidt
Newell R. Ziegler

Assistant Professor

S. Gaylen Bradley
Wendell H. Hall
C. Albin Matson
Leroy C. McLaren
William H. Murphy, Jr.
Robert B. Schultz

Instructor

Robert A. Bridges
Samuel J. Deal
John J. Holland
James T. Prince
John D. Ross
Robert W. Tankersley, Jr.
John E. Verna

Research Associate

Gerhard Brand
J. Johanna Clausen
Fritz Lehmann-Grube

Teaching Assistant

Dorothy Anderson
Julia Anderson
George Becker
William Begue
Natalie Cremer
Richard Crowell
Bruno Cunha
Hanna Doany
Del Rose Dubbs
John Duerre
Ollie Eylar
Vincent Felitti
William Feller
Robert Ferguson
Joanne Finstad

THE MEDICAL BULLETIN

Martin Freundlich
 Andrew Granston
 Ronald Hinz
 Richard Hyde
 Lawrence Jayko
 John Jewell
 George Kenny
 Ho Wang Lee
 Richard Lyon
 Ovidio Mira
 Chin Yong Park
 Mary Pollock
 Judith Tennant
 Thomas White
 Donald Willoughby
 Massis Yeterian

CONTINUATION MEDICAL EDUCATION

N. L. Gault, Jr.,
 Director and Assistant
 Dean

HOSPITAL LABORATORIES

Gerald T. Evans, Director
 Ellis S. Benson,
 Associate Director
 Newell R. Ziegler,
 Director of Blood Bank
 R. Dorothy Sundberg,
 Hospital Hematologist
 Franklin Wallace,
 Associate Professor
 Zoology, Consultant in
 Parasitology
 Robert Bridges,
 Clinical Bacteriologist
 Ruth Hovde,
 Associate Director of
 Medical Technology
 Verna Rausch,
 Assistant Professor in
 Medical Technology
 Grace Mary Ederer,
 Senior Administrative
 Laboratory Technologist
 Lorraine Gonyea, Instructor
 in Medical Technology,
 Hematology Laboratory
 Esther Freier, Instructor in
 Medical Technology,
 Hospital Chemist
 Dorothy Ness, Instructor in
 Medical Technology,
 Hospital Bacteriologist
 Elaine Duerr, Instructor
 in Medical Technology,
 Pathology Laboratory
*Instructor and Student
 Technologist Supervisors*
 Patricia Hanauer
 Betty Ruspino

Medical Fellow
 James Scott Abercrombie
 Rex Conn
 Lucille Hoiland
 Bruce Jarvis
 Werner Kraatz
 Samuel Southwick
 Edmond Yunis

MEDICINE

Cecil J. Watson,
 Professor and Head
Professor Emeritus
 Moses Barron
 George E. Fahr
 Henry L. Ulrich
 S. Marx White

Professor
 Gerald T. Evans
 Edmund B. Flink
 Ivan D. Frantz
 J. Arthur Myers
 Wesley M. Spink

Clinical Professor
 Reuben A. Johnson
 Thomas Lowry
 Frederick H. K. Schaaf

*Clinical Associate
 Professor Emeritus*
 Carl B. Drake
 Thomas A. Peppard

Associate Professor
 Ellis Benson
 Paul S. Hagen
 Wendell H. Hall
 Frederick W. Hoffbauer
 Robert B. Howard
 B. J. Kennedy
 Samuel Schwartz
 Louis Tobian
 Leslie Zieve

Clinical Associate Professor
 Donald Amatuzio
 Karl W. Anderson

J. S. Blumenthal
 Reuben Berman
 John J. Boehrer
 John F. Briggs
 James B. Carey, Sr.
 E. P. K. Fenger
 Howard L. Horns
 Wyman Jacobson
 Arthur C. Kerkhof
 Donald McCarthy
 Chauncey A. McKinlay
 L. Raymond Scherer
 Horatio B. Sweetser, Jr.
 Macnider Wetherby
 J. Allen Wilson
 Ragnvald S. Ylvisaker

Assistant Professor
 James B. Carey, Jr.
 Edmund P. Eichhorn
 Abraham Falk

N. L. Gault
 Frederick C. Goetz
 Wayne Hoseth
 Frank M. MacDonald
 Richard Magraw
 William F. Mazzitello
 M. J. Murray
 Ralph E. Smith
 C. Paul Winchell
 Horace Zinneman

Clinical Assistant Professor

Rolf L. Andreassen
 Paul J. Bilka
 Joseph F. Borg
 Jay C. Davis
 Richard J. Frey
 Benjamin F. Fuller
 Robert A. Green
 Albert J. Greenberg
 Mark Hanson
 Douglas P. Head
 Edgar T. Herrmann
 John W. Johnson
 John W. LaBree
 Walter F. Larrabee
 George X. Levitt
 Paul T. Lowry
 Frank Martin
 Harold E. Miller
 J. C. Miller
 Johannes K. Moen
 James Myhre
 William E. Petersen
 Herbert F. R. Plass
 Fred A. Rice
 Dean K. Rizer
 George G. Roth
 Joseph M. Ryan
 Alvin L. Schultz
 Andrew Shea
 Adam Smith
 Ben Sommers
 A. Boyd Thomes
 Lowell Weber
 Asher A. White

Instructor

Carl S. Alexander
 Frank C. Brakel, Jr.
 James L. Brown
 Thaddeus Chao
 Robert E. Doan
 Richard P. Doe
 Sigrid Gilbertsen
 William Goodnow
 George B. Gordon
 Henry A. Johnson
 Charles P. Kolars
 Mary M. Miller
 Donald T. Olson
 Robert G. Rossing
 Raymond W. Scallen
 Naip Tuna
Clinical Instructor
 Robert D. Blomberg
 Donald G. Bohn

THE MEDICAL BULLETIN

Ephraim B. Cohen
 Henry W. Cohen
 David M. Craig
 James Dahl
 Frederick Englund
 John Gifford Fee
 William R. Fifer
 David L. Fingerman
 Earl Hill
 John E. Holt
 Milton M. Hurwitz
 Martin E. Janssen
 Herbert W. Johnson
 David Jones
 Markle Karlen
 Robert E. Lindell
 Charles E. Lindemann
 Russell C. Lindgren
 James C. Mankey
 Charles N. McCloud
 John R. Meade
 Burton Mears
 Jack T. Murphy
 O. L. Norman Nelson
 William A. O'Brien
 Valentine O'Malley
 William D. Remole
 Alan P. Rusterholz
 William M. Schulze
 Marguerite Schwyzer
 Philip H. Soucheray
 Donald B. Swenson
 Richard Tregilgas
 Jack Vennes
 A. Cabot Wohlrabe
Clinical Assistant
 Dale H. Correa
 Earl T. Opstad
 Frank Andrew Ubel, Jr.
Medical Fellow
 Robert D. Allbaugh
 Richard Allen Anderson
 William Evan Anderson
 William Michel Awad, Jr.
 Mohammed Abdul Aziz
 Jerome Jennings Ballantine
 Graham Beaumont
 Henry Simon Bloch
 Allen G. Brailey, Jr.
 Rene Braun
 Kenneth Ralph Briggs
 Charles R. Chedister
 Richard Bradley Davis
 Alfred Eichenholz
 Alvin John Elliott
 Rafael Fernandez
 Frederick Geisert
 Harry Glenchur
 William Grimm
 Ko Ko Gyi
 Gisela Haneman
 Kenneth George Hanson
 John Corrin Hutchinson
 Maynard E. Jacobson
 Wallace V. Jenkins

John W. Jenne
 Edward A. Johnson
 Dennis J. Kane
 William A. Kern
 James H. Kelly
 John P. Kinnard
 Richard Kline
 Gerhard Mack
 Robert A. Maslansky
 Robert J. McCollister
 James C. Melby
 Eusebio R. Mendoza, Jr.
 Robert O. Mulhausen
 Charles Nuebel
 Frank J. Owens
 Lila Jean Pasnick
 Dragojla Popovich
 Robert A. Raich
 Thomas M. Recht
 Rudolph J. Ripple
 Gordon Leonard Robertson
 Robert J. Schultz
 Russell T. Schultz
 Paul Selchau
 Hobert J. Setzer
 Duane Samuel Smith
 Louis Herman Stahn
 Benjamin Glenn Vines
 Eugene H. Walker
 Marilyn Wells

DIVISION OF DERMATOLOGY

Francis W. Lynch,
Professor and Director
Professor Emeritus
 Henry E. Michelson
Clinical Professor
 Carl W. Laymon
Clinical Associate Professor
 Stephen Epstein
Clinical Assistant Professor
 Frederick T. Becker
 I. Fisher
 Elmer M. Rusten
Instructor
 Ramon M. Fusaro
Clinical Instructor
 Charles Balogh
 Elmer T. Ceder
 Robert W. Goltz
 Elmer M. Hill
 Irvine Karon
 Sheldon Mandel
 Orville E. Ockuly
 Harold G. Ravits
 Nadine C. Smith
 C. Gordon Vaughan
Clinical Assistant
 Samuel Mackoff
Medical Fellow
 Duane R. Anderson
 Hubert Brown
 Paul V. Cummsky
 Richard Dahlen

Mary Maguire
 Milton J. Orkin
 Daniel F. Shanahan
 James L. Tuura

OBSTETRICS AND GYNECOLOGY

John L. McKelvey,
Professor and Head
Associate Professor
 Irwin H. Kaiser
Clinical Assistant Professor
 Alex Barno
 Irving Bernstein
 Claude J. Ehrenberg
 Donald W. Freeman
 Louis L. Freidman
 George E. Hudson
 Leonard A. Lang
 Mancel T. Mitchell
 William P. Sadler
 Rodney F. Sturley
 Roy E. Swanson
Instructor
 James R. Bergquist
 George W. Janda
 Konald A. Prem
Clinical Instructor
 Milton Abramson
 Titus P. Bellville
 Joseph F. Bicek
 Ray F. Cochrane
 John S. Gillam
 Joseph Goldsmith
 John A. Haugen
 Albert F. Hayes
 Eugene M. Kasper
 Harold R. Leland
 Edward C. Maeder
 Charles E. Proshok
 Owen F. Robbins
 David I. Seibel
 Melvin B. Sinykin
 James J. Swendson
Clinical Assistant
 Paul N. Larson
 Charles H. McKenzie
Medical Fellow
 Leon L. Adcock
 Melvin P. Baken
 Robert C. Goodlin
 Ernest Goodman
 Robert R. Horton
 Thomas H. Kirschbaum
 Ernest W. Lowe
 John E. Mathers
 Edgar L. Makowski
 Eugene W. Mauch
 Milton G. Mutch

OPHTHALMOLOGY

Erling W. Hansen,
Clinical Professor and Head

THE MEDICAL BULLETIN

Associate Professor
Ernst Simonson

Clinical Associate Professor
Hendrie W. Grant
Walter L. Hoffman
Charles Hymes
John P. Wendland

Clinical Assistant Professor
Edward P. Burch
Richard C. Horns
Bruce L. Kantar
Robert H. Monahan
Karl E. Sandt
Virgil J. Schwartz

Clinical Instructor
Frank Adair
Wilfred Bushard
Llewellyn Christensen
Robert R. Cooper
Robert J. Fink
Harry S. Friedman
Joseph L. Garten
Bourne Jerome
R. O. Leavenworth, Jr.
Vernon L. Lindberg
Winston R. Lindberg
Malcolm A. McCannel
John A. McNeill
Louis A. Nelson, Jr.
Thomas W. O'Kane
Harry L. Plotke
Robert E. Rocknem
Irving Shapiro
Howard Shaw
Leander T. Simons
Gordon E. Strate
George T. Tani
Frederic F. Wippermann

Medical Fellow
Douglas L. Johnson
Richard A. Ness
Thomas K. Rucker

OTOLARYNGOLOGY

Lawrence R. Boies,
Professor and Head

Professor
Henry L. Hanson

Clinical Professor
Anderson C. Hilding
Jerome A. Hilger

Clinical Associate Professor
John J. Hochfilzer
Robert E. Priest

Clinical Assistant Professor
Benjamin Bofenkamp
Conrad J. Holmberg
Douglas Kusske
Graham G. Smith
George M. Tangen, Sr.
Harold S. Ulvestad

Instructor
Kurt Pollak

Clinical Instructor
Ellis Ellison

John Glaeser
Malcolm R. Johnson
Robert L. Koller
Bradley Kusske

Medical Fellow
James Donaldson
Albert Hohmann
Donald Kilgore
Duane Nagle
Robert Richardson
George M. Tangen, Jr.

PATHOLOGY

James R. Dawson, Jr.,
Professor and Head

Professor Emeritus
Elexious T. Bell
Benjamin J. Clawson

Professor
Robert Hebbel
James S. McCartney

Associate Professor Emeritus
Kano Ikeda

Associate Professor
Nathaniel Lufkin
John Noble

Assistant Professor
Joel G. Brunson
John I. Coe
Paul H. Lober
Lee W. Wattenberg

Instructor
Paul R. Finley
Donald Gleason
G. Aurebeck Lindseth

Clinical Instructor
S. Steven Barron
Craig Freeman
Ellery James
Allen Jay
Alan Judd
Stanley Lofsness
Frederick Lott
James McClellan
Martin Segal
Walter Subby

Medical Fellow
Richard L. Davis
William A. Foley
John A. Gronvall
Mitchell J. Rosenholtz
Richard M. Steidl
Louis J. M. Tremblay

Clinical Fellow
Charles N. Gamble
Robert E. Rydell

DIVISION OF CANCER

BIOLOGY
John J. Bittner,
Professor and Director

Associate Professor
Franz Halberg

Assistant Professor
Herbert M. Hirsch

PEDIATRICS

John A. Anderson,
Professor and Head

Professor
Robert A. Good

Clinical Professor
Bryng Bryngelson
Hyman S. Lippman
Erling S. Platou
Albert V. Stoesser

Associate Professor
Robert A. Ulstrom
Lewis W. Wannamaker
Mildred R. Ziegler

Clinical Associate Professor
Joseph T. Cohen
Paul F. Dwan
Harold Hanson
L. F. Riehdorf
David Siperstein
Robert L. Wilder

Assistant Professor
Paul Adams
Ray C. Anderson
Eleanor Colle
Paul Ellwood
Richard B. Raile
Richard Von Korff

Clinical Assistant Professor
S. L. Arey
Northrop Beach
Marguerite Booth
Heinz Bruhl
Woodard Colby
Harold Flanagan
Frank Hedenstrom
Emanuel Lippman
Elizabeth Lowry
Edward Nelson
Alfred Ouellette
Theodore Papermaster
Edwin Robb
Robert Rosenthal
W. Ray Shannon
Willis Thompson

Instructor
Heinz Berendes
Robert A. Bridges
William Krivit
Harold Sterling
Howard Worthen

Clinical Instructor
Arnold Anderson
Alice Brill
Alice Fuller
John J. Galligan
Hermina Hartig
Evelyn Hartman
William Heilig
George W. Lund
William Mulholland
Lloyd Nelson
Everett Perlman
Frances E. Schaar

THE MEDICAL BULLETIN

Albert Schroeder
Eva Shaperman
Theodore Smith
Ellsworth Stenswick
Edward Strem
John Tobin
Richard Tudor

Research Fellow
Gunnar Biering
John Bornhofen
Alice Bronfenbrenner
Donald Eitzman
Bernard Pollara
Paul Quie
Robert Vernier

Clinical Assistant
Eldon Berglund
Edwin Burklund
Lawrence Erickson
Andrew Erlanson
Robert Gibbs
Clayton Green
Richard Lien
Wallace Lueck
Sidney Scherling
Lewis Sher
Henry Staub
Edward Walsh

Medical Fellow Specialist
Gerald Schiebler

Medical Fellow
Sol Austrian
Elia Ayoub
Barbara Burke
John Carlisle
Hugh Dillon
Ida Gans
Harold Katkov
L. Jerome Krovetz
Arthur Page
John Reynolds
Harold Richardson
Herbert Ruttenberg
Bodulf Schnabel
Kenneth Swaiman
Robert Tolson
John Veit
Francis Wright

**DIVISION OF
CHILD PSYCHIATRY**
Reynold A. Jensen,
Professor and Director

Instructor
Elaine K. Chong
Wentworth Quast
William Wolking

Clinical Instructor
Denton Engstrom

Medical Fellow Specialist

Ruth S. Hase
Medical Fellow
Thomas L. Schafer

PHARMACOLOGY

Raymond N. Bieter,
Professor and Head

Professor
Harold N. Wright
Wilbur M. Benson
Assistant Professor
Elizabeth M. Cranston
K. A. Exley
Teaching Assistant
John D. Palmer
Robert G. McConnell

PHYSICAL MEDICINE AND REHABILITATION

Frederic J. Kottke,
Professor and Head

Professor
William G. Kubicek
Clinical Professor
Miland E. Knapp
Assistant Professor
Borghild Hansen
Ruby M. Overmann
William Fleeson
Instructor

John D. Allison
Marian Eliason
Glenn Gullickson, Jr.
Marvin G. Lepley
Wilbur L. Moen
James F. Pohlilla
Helen Skowlund
Harold M. Sterling
Elizabeth Waggoner

Clinical Instructor
J. P. Engel
Sarah J. Gault
Arthur B. Quiggle

Medical Fellow
Michael Kosiak
Bernard Sandler
Herbert Schoening
Walter C. Stolov
Julio P. Roasenda

PHYSIOLOGICAL CHEMISTRY

W. D. Armstrong,
Professor and Head

Professor
Cyrus P. Barnum, Jr.
Paul D. Boyer
Ivan D. Frantz
David Glick
Ralph T. Holman
Karl Sollner
Associate Professor
Helmut R. Gutmann
Assistant Professor
Charles W. Carr
William O. Caster
Leon Singer

John F. Van Pilsun
Richard W. Von Korff
Instructor

Curtis H. Carlson
Teaching Assistant
Leland K. Dahle
D. Holly K. Hayes
David H. Ives
Lester L. Lansky
Quenton T. Smith

PHYSIOLOGY

Maurice B. Visscher,
Professor and Head
Professor

E. B. Brown, Jr.
Joseph T. King
Nathan Lifson
Victor Lorber
Herbert Wells
Associate Professor
John A. Johnson
Carlos Martinez
Assistant Professor
H. Mead Cavert
Robert L. Evans
Eugene Grim
Research Associate
Lerner B. Hinshaw
Y. Chiung Puh Lee

Instructor
David Schafer
John Trank
Research Scholar
John MacArthur
Research Fellow
John Love
Alan Thompson
Teaching Assistant
Elias Chacalos
Shirley Schmidt
George Wermers

PSYCHIATRY AND NEUROLOGY

Donald W. Hastings,
Professor and Head

DIVISION OF PSYCHIATRY
Professor
Reynold A. Jensen
Burtrum C. Schiele
Werner Simon
Clinical Professor Emeritus
Ernest M. Hammes, Sr.
Joseph C. Michael
Clinical Professor
Dale C. Cameron
S. Alan Challman
Adelaide Johnson
Hyman S. Lippman
Associate Professor
Richard W. Anderson
Bernard C. Gluek, Jr.
Robert Hinkley
Richard M. Magraw

THE MEDICAL BULLETIN

Clinical Associate Professor

Clifford O. Erickson
Harold B. Hanson
Gordon R. Kamman
Marvin Sukov
Assistant Professor
William Fleeson
Fred Gross
Gove Hambidge, Jr.
C. Wendell Hopkins
Frank Kiesler
Carl Koutsky
Henry Lamb
Myron Messenheimer
Otto N. Raths, Jr.

Clinical Assistant Professor

Irving Bernstein
Leslie Caplan
Philip Feinberg
Clarence J. Rowe
William F. Sheeley

Instructor

Margaret Bailey
William Jepson
Henry A. Johnson
Orville Johnson
J. Benjamin Lund
Donald M. Mayberg
Frances Olson
Richard R. Teeter

Clinical Instructor

Robert Bush
Robert Clark
Donald Daggett
James Garvey
Joyce S. Lewis, Jr.
James Lyons
Jennings C. Peteler
Anthony Pollock
Mary Teberg

Professorial Lecturer

Burton P. Grimes
Ralph Rossen

Medical Fellow

Richard Bealka
James Benepe
Alan Brinsmade
George Dorsey
Floyd K. Garetz
Charles Haberle
Alan Hovda
Richard Kastner
Richard Kogl
Glenn Lewis
David MacNaughton
Abelardo Mena
Ivan Sletten

DIVISION OF NEUROLOGY

A. B. Baker,
Professor and Director

Professor

Royal C. Gray

Clinical Professor

Harold H. Noran

Associate Professor

Maynard M. Cohen
Clinical Associate Professor
Walter Gardner
Robert Meller
Zondal R. Miller
Joseph Resch
Assistant Professor
Harold Berris
Harold P. Cohen
Frank Morrell
David Webster

Clinical Assistant Professor

William S. Chalgren
Ernest M. Hammes, Jr.
Hildred Schuell
Sidney K. Shapiro
V. Richard Zarling

Instructor

Anthony Iannone
John Logothetis
David Mendelson
Erland R. Nelson
Fernando Torres

Clinical Instructor

Harris G. Bernhisel
Andrew Leembuis
Robert Stoltz

Research Fellow

Sping Lin

Research Assistant

Sita Pothapragada

Medical Fellow

Milton G. Ettinger
George Flora
Gilbert Frank
John T. Kelly
Motoji Miyazaki
William Norman
Francis W. Ramsay
Gilbert Ross
Frederic Wilson
Hans Zwang

DIVISION OF CLINICAL

PSYCHOLOGY

Starke R. Hathaway,
Professor and Director

Professor

Paul E. Meehl

Associate Professor

William Schofield

Assistant Professor

Peter F. Briggs
Harold Gilbertstadt
Gordon Heistad
David T. Lykken
Manfred Meier
Daniel N. Wiener
Robert Wirt

Instructor

John P. Brantner
Alexander Caldwell
Thomas J. Kiresuk
Guy H. Miles

Wentworth Quast

William Wolking

Clinical Instructor

Leo Hanvik
Murray Stopol

Research Fellow

Lawrence A. Young

Teaching Assistant

Charles Dicken

Research Assistant

Gayle Lumry

Aurelio Torres

RADIOLOGY

Harold O. Peterson,
Professor and Head

DIVISION OF ROENTGEN

DIAGNOSIS

Associate Professor

Joseph Jorgens
Charles M. Nice, Jr.

Clinical Associate Professor

J. Richards Aurelius
Daniel L. Fink
Oscar Lipschultz

John P. Medelman

Assistant Professor

Richard G. Lester

Clinical Assistant Professor

Osmond J. Baggenstoss
Chauncey N. Borman
Samuel B. Feinberg
Sewell Gordon
Cyrus Owen Hansen
Malcolm B. Hanson
Gjert Kelby
Donald H. Peterson

Instructor

Heino Alari
Norman Blank
Richard Greenspan
David Rosenblum
William A. Wilcox

Clinical Instructor

Eugene Ahern
John R. Amberg
Manouchehr Azad
John O. Borman
Stanford H. Calin
John B. Coleman
George Ellenz
Marvin Goldberg
Frank R. E. Gratzek
Barnard Hall
Richard S. Johnson
Robert Kasper
Warren L. Kump
Thomas B. Merner
Harry Mixer
Leo Nash
Ames Naslund
Paul C. Olfelt
Arnold O. Rholl
Elliott B. Springer

THE MEDICAL BULLETIN

Richard C. Tucker
Stanley C. VonDrashek
Kent F. Westley
Medical Fellow Specialist

Kurt Amplatz
Medical Fellow

Luis Ardila
John Bellomo
E. Fred Brauti
Stanley L. Chow
Bhasker Desai
Philip M. Fox
Lloyd Gillin
Edgar N. Gipson
H. Wilson Godfrey
Seymour Handler
Frederick Henke
Jule J. Hopperstad
Maland C. Hurr
John E. Indihar, Jr.
Ilmar Kiesel
Paul Leon
J. Paul Leonard
Arthur Lieber
Andrew R. Lillie
Donald McFarlane
James A. McNally
Gilbert Melnick
Ambat Menon
Earl Pash
Loren Rothstein
William Stevens
Gordon Taylor
Henry W. Walters
Hubert Werthmann
Justin L. Williams
George P. Wilson

DIVISION OF RADIATION THERAPY

Donn G. Mosser,
Associate Professor
and Director
Professor Emeritus
K. Wilhelm Stenstrom
Associate Professor
James Marvin
Assistant Professor
Merle Loken
Clinical Assistant Professor
Solveig M. Bergh
Elmer Paulson
Clinical Instructor
Arnolds Veinbergs

SCHOOL OF PUBLIC HEALTH

Gaylord W. Anderson,
Mayo Professor and
Director
Professor Emeritus
Jay A. Myers
Professor
Ray M. Amberg
Herbert M. Bosch

Ruth E. Boynton
Ruth E. Grout
James Hamilton
Marion I. Murphy
Theodore A. Olson
James W. Stephan
Stewart C. Thomson
Helen M. Wallace
Associate Professor
Jacob Bearman
Richard G. Bond
Donald W. Cowan
Gertrude M. Gilman
Richard B. McHugh
George Michaelsen
I. Richard Savage
Leonard M. Schuman
Ruth von Bergen

Assistant Professor

Murray Bates
Nora Cline
Arthur G. Hennings
Eugene A. Johnson
Phillip D. Kernan
Edith M. Lentz
Mary Ann McIntyre
Benjamin R. Reiter
Tomic Romson
Evelyn Sanburn
Eugene Staples
Barbara Stocking
George E. Williams

Instructor

Elbert E. Gilbertson
Ruth Ingrham
Clayton R. Lagerquist
Marian L. McReavy
Robert G. Michaels
Hugh D. Putnam
Ralph O. Wollan
Lee D. Stauffer
Vernon Weckwerth

Research Fellow

Myrtle Rueger

Medical Fellow

Ernest Ager
Maurey Allen
William Dewey
Polly B. Feigl
Warren H. Gullen
Iver A. Iversen
Whitney L. Johnson
Kathleen M. Keenan
Curtis Meinert
Austin Pryor
Henry B. Tingey
Joseph Wagoner
David Webster

LABORATORY OF PHYSIOLOGICAL HYGIENE

Ancel Keys,
Professor and Director

Professor
Josef Brozek
Henry L. Taylor
Associate Professor
Joseph T. Anderson
Francisco Grande
Ernst Simonson
Research Associate
Henry Blackburn, Jr.
Hiroyoshi Mori
Kyoichi Nakagawa
Esko Orma
Sven Punsar
Robert Rotenburg
Research Assistant
John Gilbertson
Loring Rowell

SURGERY

Owen H. Wangenstein,
Professor and Chairman
DIVISION OF GENERAL
SURGERY
Professor Emeritus
Arthur A. Zierold
Professor
C. Walton Lillehei
Richard L. Varco
Clinical Professor
Orwood J. Campbell
Thomas J. Kinsella
N. Logan Leven
Charles E. Rea
Oswald S. Wyatt
Associate Professor
Donald J. Ferguson
Lyle J. Hay
Claude R. Hitchcock
Bernard Zimmermann
*Clinical Associate Professor
Emeritus*
Martin A. Nordland
Clinical Associate Professor
George S. Bergh
Davitt A. Felder
L. Haynes Fowler
William A. Hanson
Victor Hauser
Earl C. Henrikson
N. Kenneth Jensen
Conrad I. Karleen
Arnold J. Kremen
Bernard G. Lannin
Frederick M. Owens, Jr.
Edward A. Regnier
Carl O. Rice
Willard D. White
Assistant Professor
Stuart W. Arbelger
Gilbert S. Campbell
Joseph J. Garamella
Samuel Hunter
William D. Kelly
Lloyd D. MacLean

THE MEDICAL BULLETIN

Fletcher A. Miller
Yoshio Sako
W. Albert Sullivan
Alan Thal

Clinical Assistant Professor

Samuel G. Balkin
Tague C. Chisholm
Coleman J. Connolly
Leo C. Culligan
George D. Eitel
William F. Hartfiel
Lawrence D. Hilger
Robert F. McGandy
Donald C. MacKinnon
Daniel J. Moos
Maynard C. Nelson
Nathan C. Plimpton
Frank Quattlebaum
Walter R. Schmidt
Vernon D. E. Smith
Lyle Tongen
Robert W. Utendorfer

Instructor

John F. Perry
Herbert E. Warden

Clinical Instructor

John F. Alden
U. Schuyler Anderson
Frank S. Ankner
Ernest Berkas
Manuel R. Binder
John W. Braasch
Raymond E. Buirge
Merrill D. Chesler
Charles T. Eginton
Edward C. Emerson
David Gavisier
John K. Grotting
Robert N. Hammerstrom
Carter W. Howell
Frank E. Johnson
Clarence V. Kusz
Lawrence M. Larson
Louis C. Lick
Stanley R. Maxeiner
Berton D. Mitchell
John R. Rosenow
Hanns Schwyzer
Horace G. Scott
Abbott Skinner
Bernard J. Spencer
Joseph L. Sprafka
William E. Stephens
Rolla I. Stewart
Jacob Strickler
John E. Twomey
Darrell E. Westover

Clinical Assistant

Edwin G. Benjamin
Harold S. Benjamin
Robert P. Caron
Hamlin Mattson
Wallace I. Nelson

Medical Fellow

Norman Ackerman
J. Bradley Aust
Gilbert Bacon
C. N. Barnard
Eugene Bernstein
Emile Bertho
Richard Cardozo
James Casey
Norman Crisp
Stacey B. Day
Richard A. DeWall
Raymond Doberneck
Richard H. Egdahl
Richard Ernst
Hussain Fadhli
William Feller
Henry Gans
Victor Gilbertsen
Juan Gonzalez
Bernard Goott
Vincent Gott
Theodor Grage
Ward Griffen
Ali Hakim
Paul Hodges
D. Ben Houle
Kamil Imamoglu
Benjamin Jackson
Conrad Jenson
W. Robert Leslie
Richard Lillehei
David Long
J. Lunseth
Donald McQuarrie
W. Moran
A. Mowlem
Frederick Neher
Robert Olodart
Reuben Oropeza
Raymond Read
L. S. Richards
Harlan D. Root
J. Rosenberg
Peter Salmon
Eugene Saxon
George Schimert
D. Shahon
David Snyder
Paul Stanley
Laurence Sterns
George Stirling
Kazumi Taguchi
Tatsuo Tamiya
Maung Than
John Waldron
Erich Wisliol
Po Ya
E. Yonehiro

DIVISION OF NEUROSURGERY

William T. Peyton,
Professor and Director
Professor
Lyle A. French

Clinical Professor

Wallace P. Ritchie
Clinical Assistant Professor
Harold F. Buchstein
Leonard A. Titrud

Clinical Instructor

Paul S. Blake
David R. Johnson
Robert L. Merrick

Medical Fellow

Lucien Hodges
Alan Scott
Bo Simm
Jimmy Story
Richard Strassburger
Max Zarleng

DIVISION OF ORTHOPEDIC SURGERY

John H. Moe,
Clinical Professor and
Director

Professor Emeritus

Wallace H. Cole

Clinical Professor

Edward T. Evans
Harry B. Hall

Clinical Associate

Professor Emeritus

Carl C. Chatterton

Clinical Associate Professor

Malvin J. Nydahl

Clinical Assistant Professor

Frank S. Babb
Lester W. Carlander
Walter Indeck

Richard H. Jones

Donald Lannin

D. Keith Millett

E. Harvey O'Phelan

Richard Reiley

Frederick G. Rosendahl

Kenath H. Sponsel

Clinical Instructor

John F. Beer
Wesley H. Burnham

Meyer Z. Goldner

Richard J. Johnson

Edward H. Kelly

Donovan L. McCain

Roland F. Neuman

Medical Fellow

Melitta Berkemann

Richard Granquist

David Skagerberg

DIVISION OF PROCTOLOGY

Walter A. Fansler,
Clinical Professor and
Director

Clinical Associate Professor

William C. Bernstein

Clinical Assistant Professor

Howard M. Frykman

Harold Hullsiek

Charles A. Neumeister

THE MEDICAL BULLETIN

Lloyd F. Sherman
 Robert J. Tenner
Clinical Instructor
 Loren E. Nelson
 William T. Smith
Medical Fellow
 Richard Capek
 DIVISION OF UROLOGY
 C. D. Creevy,
 Professor and Director
Clinical Professor
 Frederick E. B. Foley
Clinical Associate Professor
 Theodore H. Sweetser
Clinical Assistant Professor
 Samuel S. Beirstein
 Baxter A. Smith
 Edgar A. Webb
Instructor
 Julian Ansell
 Milton Reiser
Clinical Instructor
 David M. Anderson
 George L. Garske
 Irving Glassberg
 Hugo E. Miller
 William E. Price
 Harold A. Reif
 Richard S. Rodgers
 Ragnar T. Soderlind
 Gordon W. Strom
Clinical Assistant
 Edward J. Richardson
Research Assistant
 Donald Bravick
Medical Fellow
 James Cooper
 Carlos Guzman
 Paul Kowalishin

UNIVERSITY HEALTH SERVICE

Ruth E. Boynton, Director
 Donald W. Cowan,
 Assistant Director
Full-Time Medical Staff
 Murray Bates
 Elaine M. Benthack
 Robert C. Hinckley
 Bjarne Houkom
 Phillip W. Hursh
 Phillip D. Kernan
 H. Douglas Lamb
 Myron G. Messenheimer
 Visvaldis Nagobads
 Lydia I. Neibergs
 Benjamin R. Reiter
 Maurice A. Shillington
 Stella H. Sikkema
 Hugh J. Thompson
Part-Time Medical Staff
 Melitta Berkemann

Dorothy M. Bernstein
 Mary P. Christensen
 Henry W. Cohen
 Helen J. Dahl
 James C. Dahl
 John E. Eichenlaub
 Ellen Z. Fifer
 William R. Fifer
 Paul R. Finley
 L. Haynes Fowler
 David Gold
 Helen L. Haberer
 Donald W. Hannon
 Rollin M. Hansen
 George W. Hauser
 William R. Jahnke
 Bruce W. Jarvis
 Harold A. Kaplan
 Irvine M. Karon
 Robert L. Koller
 Robert H. Kooiker
 Michael Kosiak
 Katherine K. Laine
 Donald R. Lannin
 Cheng-en Lu
 James H. Lyons
 C. A. McKinlay
 John E. Middlebrook
 Fletcher Miller
 Orville E. Oeckly
 Olga Olavs
 Kurt Pollak
 R. L. Schmidtke
 John T. Smiley
 Carol Snyder
 Robert J. Tenner
 Francis B. Tiffany
 C. Gordon Vaughn
 John P. Wendland
 Sabina S. Zimerring

INTERNS

Pediatrics

Ane Marie Amundsen,
 University of Oslo
 Charles J. Beauchamp,
 Jefferson Medical College
 Aldon E. Clark,
 Stanford University
 Carl B. Heggstad,
 University of Minnesota
 V. Shantha Rajagopalan,
 Madras Medical College
 Ruy de Souza Rocha,
 Faculdade de Ciencias
 Medicas
 Henry S. Sauls, Jr.,
 Medical College of
 Alabama
 Joseph W. St. Geme, Jr.,
 Stanford University

Medicine

Fred Y. Durrance,
 Tulane University
 Charles H. Gregory,
 Columbia University
 John W. Hood,
 University of Oklahoma
 Robert E. Leach,
 Columbia University
 George A. Pankey,
 Tulane University
 George J. Schroepfer, Jr.,
 University of Minnesota
 Robert T. Swanson,
 University of Utah
 Solomon J. Zak,
 University of Minnesota

Surgery

Robert K. Ausman,
 Marquette University
 Joseph H. Galicich, Jr.,
 Harvard University
 David B. Harrod,
 Harvard University
 Arthur S. McFee,
 Harvard University
 William R. Meeker, Jr.,
 Medical College of
 Alabama
 Som N. Nayyar,
 University of Minnesota
 Demetre M. Nicoloff,
 Ohio State University
 Jerome H. Sacks,
 University of Minnesota
 David L. Siegal,
 Albany Medical College
 Nelson H. Stone,
 Ohio State University

Rotating

William E. Bradley,
 University of Minnesota
 Matthew Cohen,
 Tulane University
 Richard W. M. Dang,
 Northwestern University
 Thomas H. Gonior,
 University of Minnesota
 Harriet A. Hughes,
 Cornell University
 William F. Kennedy, Jr.,
 University of Maryland
 Charles W. Robinson, Jr.,
 University of Oklahoma
 Sulliam Saechew,
 Harvard University
 Thoburn F. Thompson,
 McGill University
 Donald M. Traeger,
 Columbia University
 Donald M. Yamaguchi,
 Harvard University
 Ghim L. Yeoh,
 University of Nebraska

WEEKLY CONFERENCES OF GENERAL INTEREST

Physicians Welcome

- Monday, 9:00 to 10:50 A.M. OBSTETRICS AND GYNECOLOGY
Old Nursery, Station 57
University Hospitals
- 12:30 to 1:30 P.M. PHYSIOLOGY-
PHYSIOLOGICAL CHEMISTRY
214 Millard Hall
- 4:00 to 6:00 P.M. ANESTHESIOLOGY
Classroom 100
Mayo Memorial
- Tuesday, 12:30 to 1:20 P.M. PATHOLOGY
104 Jackson Hall
- Friday, 7:45 to 9:00 A.M. PEDIATRICS
McQuarrie Pediatric Library,
1450 Mayo Memorial
- 8:00 to 10:00 A.M. NEUROLOGY
Station 50, University Hospitals
- 9:00 to 10:00 A.M. MEDICINE
Todd Amphitheater,
University Hospitals
- 1:30 to 2:30 P.M. DERMATOLOGY
Eustis Amphitheater
University Hospitals
- Saturday, 7:45 to 9:00 A.M. ORTHOPEDICS
Powell Hall Amphitheater
- 9:15 to 11:30 A.M. SURGERY
Todd Amphitheater,
University Hospitals

For detailed information concerning all conferences, seminars, and ward rounds at University Hospitals, Ancker Hospital, Minneapolis General Hospitals, and the Minneapolis Veterans Administration Hospital, write to the Editor of the BULLETIN, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.