Protein Nutrition in Surgery

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Protein Nutrition in Surgery*

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The great attention given to vitamins in the past few decades has tended to obscure the fact that other elements in the diet, particularly protein, may be of equal and sometimes greater significance. The importance of protein has also been minimized by the general belief that the body possesses large stores of protein that are able to meet the needs of an emergency or during periods of deprivation. It has been known for nearly a century that protein represents one of the most essential of the nutritional elements inasmuch as it supplies the very protoplasm of living cells, the plasma proteins of the blood as well as the many hormones and enzymes, all of which are proteins and without which vital processes are impossible.

Protein has a special significance in surgical patients because of the fact that injury and operation lead to tremendous losses of it and that even the phenomenon of surgical shock is concerned with the lack of sufficient circulating plasma protein to maintain normal fluid relationships. In spite of this, the recognition that protein metabolism is important in surgical patients came quite recently. Jones and Eaton in 1933 showed the relationship between postoperative edema and protein intake. Since then, an increasing number of observations have accumulated, all of which have emphasized the frequency with which protein deficiencies develop after operation. Moreover, the importance of protein depletion in many surgical patients requiring operation has been shown to greatly influence operability and mortality; for these reasons it is obvious that unless the surgeon has adequate knowledge of the essential features of protein metabolism and sufficient information of the methods by which the protein deficiencies can be corrected, he will be unable to achieve sufficiently good surgical results following various operative procedures, particularly those involving the alimentary tract.

Under normal conditions, protein nutrition is maintained by the intake of an adequate, well-balanced diet, containing among other things, about 1 Gm. of protein per kilogram per day in the case of an adult. Without an adequate intake of protein the body begins to live upon its own protein tissue and thus, sooner or later, produces many of the now well-known manifestations of nutritional protein deficiency.

Protein Deficiency of Nutritional Origin.—One of the important features of protein deficiency due to an inadequate intake of protein is the fact that all protein tissues in the body begin to waste from the very beginning. It is true, however, that hepatic protein is probably lost at a greater rate for the first few days or until its store is exhausted. Thereafter, all protein tissue apparently becomes depleted at an approximately equal rate, the total amount depending upon the individual mass itself. For example, the total circulating plasma albumin comprises about one-thirtieth of the total protein in the body. It has been shown that after protein deprivation one-thirtieth of the total amount of protein lost from the body is represented by the loss of plasma albumin, the rest coming from the other tissues of the body. The same relationship seems to hold when protein is administered to such a depleted individual. For every gram of food which is used for the restoration of plasma albumin, about 30 Gm. are required for replenishment of protein in the rest of the body. This physiologic concept is of great practical value because it shows how difficult it is to correct a depletion in the plasma protein without considering the protein needs in the rest of the body.

While the deprivation of protein is reflected immediately in the depletion of body protein tissue, clinical manifestations may not be apparent for some time. Perhaps the earliest evidence occurs in the liver, as might be expected from the fact that hepatic protein seems selectively depleted early. Evidence has indeed been obtained to show the relationship between protein intake and hepatic function. Moreover, the effectiveness of protein in protecting the liver against various toxins has been established just as it has in the case of carbohydrate.

Many other manifestations of protein deprivation have now been observed and rest on fairly well-established observations. These include such things as loss of appetite, asthenia, and general malaise. More specific manifestations include an increased susceptibility to infection, which has been established particularly by the extensive observations of Paul R. Cannon and his co-workers. Failure of wounds to heal, abdominal distension, evidence of intestinal obstruction have also been shown to follow severe
protein deficiency probably because of the production of what is now known as nutritional edema.

Nutritional or really malnutritional edema is perhaps one of the most striking and serious manifestations of protein deprivation. The etiologic relationship between nutritional edema and a lack of protein intake dates back only to 1922, or about twenty-five years, following the original work of Maver, of Kohman, and of Frisch and Mendel during the 1920's, and confirmed by many other workers since then. Nutritional edema due to protein deficiency is obvious clinically when it affects the subcutaneous tissues, although the same pathologic changes undoubtedly occur within the body and are responsible for disturbances in pulmonary and gastrointestinal function, leading to accumulation of fluid, particularly in the walls of the intestine, in the lumen of the intestine, and even in the peritoneal cavity. The tendency toward such an edema is often aggravated by the common practice of injecting excessive isotonic saline intravenously.

Hypoproteinemia.—For the study of protein deficiencies, chemical measurements of the plasma proteins of the body is a readily available method of diagnosis. However, such measurements must be made with care and interpreted with discrimination. The most common difficulty arises from the fact that patients with definite protein deficiencies may exhibit a normal concentration of total plasma protein. In this way a diagnosis of protein deficiency may be completely missed. On the other hand, a low plasma protein concentration definitely indicates the presence of a protein deficiency. There are two reasons why a normal value for total plasma protein may be found in patients with protein deficiencies. In one group of cases the blood is dehydrated, or to use another term, hemoconcentrated. This complication is often revealed when, after fluid balance is re-established by an adequate fluid intake, there is a fall in the initial measurements of both the red cell count and of the plasma proteins. It is important, therefore, not to depend upon the initial measurement of plasma proteins as the patient enters the hospital, but rather to repeat the determination several days later or when dehydration has been corrected. The second reason a normal value for total proteins may mask a protein deficiency is the frequent development of increases in the globulin fraction in patients with infections, with Hodgkin's disease, with lymphogranuloma venereum, etc. This is important because it is the albumin fraction which falls during protein starvation so that the low value will be completely missed if the globulin value is high. For example, many patients will have a total protein of 7 Gm. per cent, which is normal, yet the albumin level may be as low as 2 Gm. per cent, which represents a serious depletion to about half the normal, because the globulin fraction will be 5 Gm. per cent or over twice its normal value. For
this reason the diagnosis of hypoproteinemia should always be based upon fractionation of the plasma. Indeed, the term hypoalbuminemia should be used as the designation of protein depletion.

**The Effect of Surgical Procedures**

Injury in general, including surgical procedures, and the use of various anesthetic agents, increase the requirement for protein because they lead to abnormal and often large losses. These losses are based upon a variety of mechanisms which may be summarized in the two following categories.

1. Actual loss of protein occurs not only in hemorrhage, but also in wound exudates whenever there is an open defect anywhere on the surface of the body. Actual measurements from burned skin surfaces have shown that as much as 50 Gm. of protein a day may escape in this way.

   In addition to such external losses, large amounts of protein are similarly lost as a result of trauma within the body either into the tissue itself or into such body cavities as the pleural or peritoneal cavity, or even into the lumen of the gastro-intestinal tract. Actual measurements indicate that the equivalent of one to two liters of plasma may leave the circulation in this manner within a period of twenty-four hours.

2. Excessive destruction of tissue protein has long been known to occur after trauma of many kinds, as it does during infections, and goes by the traditional term of "toxic destruction of tissue protein." More recently, studies have shown that this phenomenon is probably a part of what is called the catabolic phase of injury and is probably associated with hyperactivity of the adrenal cortex, one of the hormones of which is known to provoke tissue protein breakdown. The magnitude of this loss of tissue protein may be very great indeed. It is probable that the equivalent of 1,200 Gm. of muscle tissue may be destroyed within twenty-four hours during the height of such a catabolic reaction.

   It is easy to see how a surgical patient may lose tremendous amounts of tissue protein within a relatively short period if we add the excessive losses mentioned above to the normal requirements, particularly when no attempt is made to meet any of the requirements by an adequate intake, in other words, when protein starvation is imposed upon the excessive losses which nearly always occur to a greater or less extent. If the intake of carbohydrate is inadequate, additional wastage of protein tissue will occur to supply energy. Instead of the normal requirement of about 70 Gm. of protein per kilogram per day, the actual needs may easily reach 300 or 400 Gm. of protein a day.

   To say that the administration of this large amount of protein each day would solve the problem is an oversimplification. First of all, different
kinds of protein are required to meet different needs. In the second place, many surgical patients can take nothing by mouth, thus requiring the parenteral route. In the third place, a well-balanced diet is often impossible in a sick surgical patient; and, finally, the metabolic response of a surgical patient is not necessarily the same as a normal individual. All of these considerations are important in formulating a program aimed at meeting as many of the needs as possible and in preventing many deleterious effects of protein deficiency which occur in surgical patients.

**Practical Aspects in Therapy**

It is obvious that no method for the administration of protein may overlook the need for other elements such as water and electrolyte, carbohydrate and vitamins. The interdependence of protein metabolism to these other elements is so close that consideration of them must be emphasized even though the details cannot be discussed in this short paper.

A second important feature in the practical administration of protein is exemplified by the well-known proverb “an ounce of prevention is worth a pound of cure.” In other words, the administration of protein should begin at once. Too often surgeons overlook this simple factor at the onset of therapy and awake to the need for protein administration only after serious evidence of deficiencies have developed.

In discussing the administration of protein it has been useful to consider two types of requirements:

A. The need for replacement of acute deficits.

B. The need for meeting daily requirements.

**Acute Deficits.**—Plasma and whole blood transfusions will adequately and promptly correct acute deficits due to the actual loss of whole blood or of plasma either to the outside of the body or into the damaged tissues or body cavities. The surgical conditions which are associated with such losses are fairly well known and include various types of injury: hemorrhage, burns, pneumonia, intestinal obstruction, peritonitis, extensive tissue infection, etc. The important point should be emphasized here also that such treatment must be carried out promptly. For example, the replacement of blood loss during the course of an operation should not await the development of anemia or the clinical manifestations of shock, but should be carried out at once and indeed during the operation itself, and while the loss occurs. A second point concerns the need for using adequate amounts of plasma and whole blood. In most cases at least a liter of whole blood will be needed, although obviously the amount will depend upon the individual case. During the war, for example, after extensive tissue trauma
on the battlefield, many liters of whole blood were necessary during the course of operative procedures designed to correct the effects of injury.

The question is often raised as to whether whole blood or plasma should be used. A categorical answer obviously cannot be made. Clearly, if the patient is anemic for any reason, whole blood is preferable and, indeed, red cells alone may be strongly indicated. On the other hand, when the red count is high and the patient has lost only protein-containing fluid, a plasma transfusion is preferable because per unit volume it contains twice as much protein as whole blood. The red cells occupy space and are, of course, essential when needed, but they exert no colloidal osmotic effect and therefore cannot meet protein deficiencies in the circulating plasma.

It should be mentioned, however, that both whole blood and plasma contain a considerable amount of electrolyte. This is due not only to the fact that plasma contains the same amount of sodium chloride as the extracellular fluid, but each liter contains in addition 5 Gm. of sodium citrate. Whole blood, of course, contains half as much per unit volume. This is mentioned because in certain cases the added amount of electrolyte may prove deleterious.

*Maintenance of Daily Requirements.*—An important feature of the nutritional care of surgical patients is the probability that much of the caloric requirements may be sacrificed for protein, which greatly simplifies the quantitative problem in that the total bulk of the intake can be considerably reduced. This we feel is justified whenever the patient has sufficient stores of adipose tissue from which most energy requirements can be met. On this basis we have set as the minimum requirement for an adult 100 Gm. of protein and 100 Gm. of carbohydrate, and we believe that for a short period of time this will go a long way toward preventing protein deficiencies without physiologic impairment. This basic requirement is used whether the patient is able to eat or requires parenteral alimentation.

If the patient is able to take this quantity of food by mouth, the problem of protein administration is simply that of overcoming anorexia and adequate supervision to see that the prescribed amount of protein is actually ingested. While this is a straightforward problem it is much more difficult than it appears and may require a good deal of time and attention to details. It has been our experience that a simplified liquid intake for a few days is of great practical advantage in many patients able and willing to take fluid but not solid food by mouth. For this purpose we have devised a high protein drink made by fortifying whole milk with milk proteins so that a liter contains 136 Gm. of protein and 1,700 calories. Thus, the ingestion of 3 glasses of the drink, each of 8 ounces, will give the patient 100 Gm. of protein and 1,200 calories. We have given this mixture to
hundreds of patients and have experienced little or no difficulty as far as taste and convenience are concerned. It has proved a very useful post-operative convalescent drink. It can be ordered just as medication, and thus, automatically combats starvation which frequently follows the ordering of the usual types of diets.

*Tube Feeding.*—A patient with a normal gastro-intestinal tract who refuses to even drink may require tube feeding. Tube feeding is a planned procedure, of course, in patients with a gastrostomy or jejunostomy. Tube feeding has also been used after operation, during which the surgeon introduces a nasal catheter across the gastro-intestinal anastomosis into the jejunum, for feeding purposes. Obviously all protein administered in this way must be in the form of liquids. Many mixtures for tube feeding have been devised.

In many cases, the employment of a protein hydrolyzate rather than whole protein offers certain advantages. The use of such hydrolyzates spares the need for protein digestion and in certain cases will effectively combat diarrhea which may follow the use of whole protein. A second practical advantage is the fact that much more protein nourishment can often be given in the form of hydrolyzed protein than is possible with whole protein.

*Parenteral Protein Feeding.*—Many patients can take no food by mouth for one of many reasons, so that all nourishment must be given through the parenteral channel. This is true most commonly after abdominal operations. Protein may be given either as a whole blood or plasma transfusion or in the form of an amino acid mixture. The latter is now generally available as a solution of hydrolyzed protein. Much is unknown of the metabolic fate of whole protein injected as plasma or whole blood as a source of protein nourishment. Nevertheless, ample clinical experience has demonstrated the value of this form of protein administration in malnourished patients suffering protein deficiency. As the sole source of parenteral protein feeding, it has proved disappointing; fortunately it is now no longer necessary to rely entirely on transfusion in view of the availability of hydrolyzed protein which is a mere physiologic, convenient, and inexpensive source of nitrogenous nourishment.

The use of appropriate solutions of hydrolyzed protein is now well beyond its experimental stage and has been extensively used in many thousands of patients. The author employs such a solution in conjunction with glucose in an almost complete regimen of parenteral alimentation. This is carried out as a routine in all patients, before or after operation, as long as they are unable to take protein nourishment by mouth. In most cases, two liters are given, one in the morning, one in the afternoon. Each liter contains 50 Gm. of glucose, 50 Gm. of hydrolyzed protein (Amigen), and about
2 Gm. of sodium chloride. In this way the daily requirements for water, glucose, protein, and salt are met. Separately, adequate vitamins are injected. In addition, whole blood plasma, or supplementary saline solution is injected whenever deficits in red cells, plasma protein, or sodium chloride develop.

Such a parenteral alimentation regimen has proved so much more effective than the usual injections of glucose and saline alone that restoration to normal function has occurred much more rapidly. Thus the inclusion of protein has served to shorten the period usually required for parenteral injections. In most cases the patient is able to resume a normal, oral intake within a day or two after operation. Even in gastric resections all patients by one week after operation have been taking an almost full diet by mouth.

The inclusion of protein in the parenteral fluids has also improved convalescence by leading to an early restoration of physical well being, and by permitting an earlier termination of bed rest. We have also been impressed by the absence of impaired motility or obstruction at the gastro-intestinal stoma following gastric resection or gastroenterostomy in patients given adequate protein before and immediately after operation. We have made no attempt to achieve positive nitrogen balance, but have observed a great decrease in the usual loss of nitrogen in cases given hydrolyzed protein. For example, with the routine mentioned above in which the patient received 12 Gm. of nitrogen a day, the average negative balance in seventy-six post-operative days (all severe abdominal operations) was but 3.6 Gm.; with the usual regimen of glucose only, the loss is usually 10 to 20 Gm. a day. Finally, we have found that at discharge these patients had lost very little,

TABLE—1.—*INTRAVENOUS AMIGEN INJECTIONS*

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<tr>
<th>January 1 to October 1, 1945</th>
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<tbody>
<tr>
<td>Total amount given</td>
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<tr>
<td>Total number of patients</td>
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<td>Average amount per patient</td>
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<td>Largest amount given one patient</td>
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<td>Largest amount given one patient in shortest time</td>
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<td>Total number of untoward reactions</td>
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<tr>
<td>Pyrogenic</td>
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<td>Allergic</td>
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<tr>
<td>Miscellaneous</td>
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if any weight, and an increase rather than a decrease in the level of serum albumin as compared with controls treated with the usual regimen of saline and glucose alone.

Reactions.—In the past reactions following intravenous injections of any type have, of course, been quite frequent, although the incidence has decreased tremendously with increasing knowledge of the cause of these
reactions. Similar progress has been made in the case of solutions of hydrolyzed protein. At the present time, the reaction rate is about one third of that seen with blood and plasma transfusions. In a careful study made by the author, the observations in Table 1 were made.

REFERENCES

Alumni Attend Refresher Course at Medical School

Thirty-two alumni attended a series of five refresher courses at the School of Medicine from April 7 to May 8. There were 60 men enrolled for the series, which was planned by the Division of Postgraduate Studies.

Those attending were Drs. John C. Blumenschein, '43, obstetrics and gynecology; Arnold Gumper, '34, obstetrics and gynecology, pediatrics, and internal medicine; James B. Jones, '38, internal medicine; John Walter Jones, '33, obstetrics and gynecology; Lawrence Livingston, '30, pediatrics, and obstetrics and gynecology; Lloyd Rosenbaum, '37, internal medicine; Abbott C. Scott, '31, internal medicine; Harold E. Walter, '43, obstetrics and gynecology, pediatrics, and internal medicine; Thomas Wilson, '29, pediatrics and internal medicine; Sydney T. Wright, '40, internal medicine, pediatrics, and obstetrics and gynecology.

Lawrence H. Allred, '43, obstetrics and gynecology; Robert L. Andrae, '20, pediatrics, and obstetrics and gynecology; George Bailey, '25; internal medicine; William Bernard, 39, obstetrics and gynecology; Rodney Carter, '26, internal medicine, pediatrics, and obstetrics and gynecology; Gerald Cleary, '29, internal medicine and pediatrics; Marion Dakin, '38, internal medicine; Harold Franklin, '45, internal medicine; Marvin C. Gentry, '28, internal medicine, pediatrics, and obstetrics and gynecology; Preston L. Hathcock, '29, obstetrics and gynecology; Herbert A. Iknayan, '40, obstetrics and gynecology.

Bernard Lieppman, '44, internal medicine; John P. Roberts, '45,
neuropsychiatry; James L. Rouner, '34, internal medicine; Everett Sonne-
man, '45, internal medicine; Edna Schrick, '34, pediatrics; Clarence
Schulz, '45, internal medicine and neuropsychiatry; Erich Schulz, '12,
internal medicine; Robert B. Stevens, '27, pediatrics; Val Sundwall, '31,
obstetrics and gynecology; James T. Vernon, '45, neuropsychiatry; Thomas
P. Wilson, '29, obstetrics and gynecology.

The courses were particularly designed for the general practitioner or
part-specialist, or for returning service men. Each course lasted a week.

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**Heed Ophthalmological Foundation**

**Ready to Accept Applications**

The Heed Ophthalmological Foundation has announced that it is ready
to accept candidates for a limited number of fellowships in ophthalmology.

The Foundation is headed by a board of five ophthalmologists, of which
Dr. M. Hayward Post, associate professor of clinical ophthalmology, is
secretary. All correspondence for the board is carried on through Dr. Post.

The primary purpose of the board, according to Dr. Post, is to give
advanced study in ophthalmology, with particular reference to surgery.
The Foundation was founded by Mr. and Mrs. Thomas B. Heed of Chicago.

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**American Cancer Society Honors**

**Nine Members of Faculty**

Nine members of the faculty were honored by the American Cancer
Society on January 29 for their 10 years of service to the Society in
St. Louis.

They are Dr. Richard S. Weiss, professor of clinical dermatology; Dr.
A. H. Conrad, assistant professor of clinical dermatology; Dr. A. Norman
Arneson, associate professor of clinical radiology and of obstetrics and
gynecology; Dr. J. Barrett Brown, associate professor of clinical surgery;
Dr. L. H. Jorstad, instructor in clinical surgery; Dr. E. Lawrence Keyes,
assistant professor of clinical surgery; Dr. G. D. Royston, professor of
clinical obstetrics and gynecology; Dr. Wendell Scott, associate professor
of clinical radiology, and Dr. C. Malone Stroud, instructor in clinical
medicine.
Medical School Has Booth at State Medical Association Meeting

The Division of Postgraduate Medical Education and the Division of Auxiliary Medical Services had a booth and pictorial display at the Missouri State Medical Association meeting in Kansas City, March 30, 31, April 1, 2.

A representative from the Medical School was stationed there to answer questions and give pamphlets concerning courses in occupational therapy, hospital administration, orthoptic technology, electroencephalographic technology, and in postgraduate medical courses.

Problems in Securing Nurses

Schools still report less applications than are needed for student nurses, but the March 5 class of 21 girls admitted to the Washington University School of Nursing is larger than pre-war classes, Miss Louise Knapp, director, said. For the next class, which will be admitted on September 8, Miss Knapp hopes to have between 50 and 60 well-qualified applicants.

Although the number of nurses per thousand population has steadily risen since 1900 and is higher now than at any previous time, nursing service is still not adequate to meet the demands of patients.

Some of the problems confronting schools of nursing in getting an adequate number of applications are:

1. Scholarship assistance for needy students.
2. Better dissemination of information about nursing and its opportunities.
3. Better conditions for graduate nurses. The main point here is a better schedule of working hours.
4. A conscientious effort on the part of all physicians to show appreciation for the work done by the nursing staff, and to keep a pleasant, personalized relationship with nurses whenever possible.

Some of the main reasons students give for selecting this medical center are the reputation of the medical center, the high standards of care given here, and the service being rendered by graduates of this school who are now employed in other parts of the country.
Dr. Moore Appointed Dean

Dr. Robert A. Moore, professor of pathology, and acting dean for the past year, has been appointed dean of the Medical School, Chancellor Arthur H. Compton has announced.

"It is with deep gratification that I have announced the appointment of Dr. Moore as dean of the School of Medicine, following his effective service as acting dean the past year," said Chancellor Compton. "Our pride in that school is enhanced by the appreciation of the continued progress which it is making under the leadership of Dr. Moore, to whom we look with personal devotion as well as admiration."

Opportunity for Young Doctor

There is an opportunity for a young doctor in Maitland, Mo., according to a letter from Mrs. Arthur Cowan, who says, "To get an M. D. one must drive at least 15 miles and sometimes 30 or 45 miles. The nearest hospital is 25 miles; to St. Joseph is 45 miles.

"I am offering my house for sale as we are moving to another location. This house has 13 large rooms, hard wood floors, spacious closets, all modern with oil burner and thermostat control. It is on one-half acre of ground, has a two-car garage, another smaller, house, fruit trees, large strawberry and blackberry patch—beautifully landscaped and a beautiful location.

"This home has two large front rooms which could be used as an office and waiting room. There are three nice rooms with a side entrance which could be used as a private apartment. The rooms upstairs are large enough to put partitions in and make enough rooms for a small general hospital for minor operations or observation cases. It could also be used for a strictly maternity hospital.

"If the doctor would prefer a separate house, there is a nice six-room house across the street that I am sure he could buy.

"I cannot stress the need for a good doctor in this community enough. There is a good drug store with a registered pharmacist, the town has city water, sewage system, "black top" streets, three churches, school, two groceries, movie, etc."
Departmental News

Surgery

Dr. Franklin E. Walton, assistant professor of clinical surgery, Dr. Carl Lischer, instructor in surgery, and Dr. Eugene Bricker, associate professor of surgery, attended the eighth annual meeting of the Society of University Surgeons in Boston February 13-15.

Four members of the department of surgery attended the American Surgical Association meeting March 25-27 at Hot Springs, Va. They are Dr. Evarts A. Graham, professor of surgery; Dr. Peter Heinbecker, Dr. Nathan Womack, and Dr. James Barrett Brown, all associate professors of clinical surgery.

Dr. Evarts A. Graham, professor of surgery, has been made an honorary member of the Belgian Society of Surgery.

Dr. D. K. Rose, professor of clinical genitourinary surgery, and Dr. Justin Cordonnier, assistant professor of clinical genitourinary surgery, attended the meeting of the Southeastern Section of the American Urological Association on March 26 at Palm Beach, Fla.

Dr. Justin J. Cordonnier, assistant professor of clinical genitourinary surgery, addressed the Tulsa County Medical Society February 24 on "Renal Calculi in Recumbency."

Radiology

Dr. Wendell Scott, associate professor of clinical radiology, was re-elected president of the St. Louis Radiological Society at a recent meeting.

Dr. William Stanbro, assistant in radiology, went to Boston from February 18-24 to learn the technique of catheterization of the heart. He worked with Dr. Merrill Sosman at Peter Bent Brigham Hospital.

Dr. Sherwood Moore, professor of radiology, has been elected Director at Large for the American Cancer Society.

Dr. Michel Berger, a delegate from the Radium Institute of Paris, arrived March 15 from Madame Curie's laboratories to study radiation therapy in the Department of Radiology.
Preventive Medicine

Dr. Gurney Clark, former head of the department of preventive medicine, has gone to New York, where he will be professor of epidemiology at Columbia University School of Public Health.

Dr. George Saunders, assistant professor of preventive medicine, went east in March to visit the departments of preventive medicine at Harvard, Yale, Long Island College of Medicine, and New York University. He also attended the National Conference on Rural Health in Chicago.

Neuropsychiatry

Dr. Conrad Somner, assistant professor of clinical psychiatry, attended the first meetings of the Advisory Committee of the National Health Council in Washington, D. C. January 22 and 23. He is a member of the Advisory Committee on Community Services. This committee and the Committees on Training and Research make recommendations for expenditures of about 10 million dollars, to be allocated by the Federal Government for improved facilities for mental health, to support research in this field, and to provide training.

Dr. George Saslow, assistant professor of psychiatry, spoke before a joint meeting of the Eastern District of Missouri Chapter of the American Physical Therapy Association and the Occupational Therapy Association of Missouri on February 13.

He conducted a discussion on “Integration of Occupational Therapy, Physical Therapy, and Psychiatric Therapy in the Rehabilitation of Patients.” He spoke at the National Vocation Guidance Association meeting in Columbia, Ohio March 29 on “Emotional Factors in Job Adjustments.”

Obstetrics and Gynecology

Dr. A. Norman Arneson, associate professor of clinical radiology and of clinical obstetrics and gynecology, gave a paper in Philadelphia April 3 on “Surgical and Radiation Trends in the Treatment of Carcinoma of the Cervix.” On April 8, he spoke to the El Paso County Medical Society on “Cancer of the Body of the Uterus” during the campaign of the American Cancer Society.
Dr. Willard Allen, professor of obstetrics and gynecology, spoke at a series of meetings during March. On March 4, he addressed the Boone County Medical Society meeting in Columbia, Mo. on “Abnormal Bleeding of the Uterus.” On March 11, he spoke in Cape Girardeau, Mo. to the Southern Section of the Missouri State Medical Association on clinical uses of female sex hormones.

He went to Fort Worth, Texas on March 21 to speak to the Sectional meeting of the American College of Surgeons on “Value of Conservative Surgery of the Pelvic Organs,” and on March 24 he spoke on “Clinical Application of Sex Hormones” at the New Mexico Clinical Society in Albuquerque, N. Mex.

Dr. R. J. Crossen, assistant professor of clinical obstetrics and gynecology, attended a meeting of the American Society for the Study of Sterility in Chicago, Ill., on March 21.

**Ophthalmology**

Dr. T. E. Sanders, instructor in clinical ophthalmology, went to Detroit March 27 to speak on “Treatment of Intraocular Tumors” at the Detroit Ophthalmological Society. He attended the organization meeting of the Ophthalmological Pathology Club in Washington, D. C. on April 15 and 16.

Dr. Lawrence T. Post, professor of clinical ophthalmology, gave a series of four lectures at the University of Minnesota for a continuation course in ophthalmology from February 17-21.

**Medicine**

Dr. Alfred Goldman, assistant professor of clinical medicine, and Dr. Llewellyn Sale, Jr., instructor in clinical medicine, went to New York Hospital recently to observe some work on streptomycin treatment of tuberculosis. They will help lay the plans to develop a program in that field at the School of Medicine.

Dr. W. Barry Wood, professor of medicine, spoke on “Treatment of Pneumonia” on February 18 in Jefferson City, Mo. at a meeting of the Missouri Medical Association.

Dr. Paul Hageman, assistant professor of clinical medicine, spoke on “Chemotherapy of Streptococcal Infection” at the meeting of the sixth Councilal District of the Missouri Medical Association at Sedalia, Mo., February 17.
Dr. H. L. Alexander, professor of clinical medicine, contributed a chapter on "Pathological Physiology of the Lungs" to a new book on Clinical Pathological Physiology, edited by Dr. W. A. Soderman of Tulane University.

Dr. W. Barry Wood, head of the department, was elected president of the St. Louis Society of Internal Medicine for 1947-48 at a recent meeting.

Dr. Paul Hageman, assistant professor of clinical medicine, attended a symposium on arthritis at the Mayo Foundation March 24-29, given by the American College of Physicians.

Occupational Therapy

Miss Dorothy Flint, instructor in occupational therapy, represented occupational therapy at the annual meeting of the Women's Career Conference at the University of Missouri on February 28. Representatives of the various professions were invited to lead discussions with women at the University.

Anatomy

Dr. Albert Lansing, assistant professor of anatomy, spoke on "Highlights of Cancer Research" at a meeting of the St. Louis Dietetic Association on March 3.

Dr. Flora Villilon has arrived from the University of Michigan to study the immunological aspects of cancer research in the Department of Anatomy.

Dr. E. V. Cowdry, head of the department, has accepted an invitation to serve as vice-president of the AAAS, Division of Medical Sciences, and of the Union Internationale Contre le Cancer.

On April 3, 4 and 5, the American Association of Anatomists met in Montreal at the Mount Royal Hotel. Those attending from the department of anatomy were Mr. C. H. U. Chu, assistant in anatomy, Dr. E. V. Cowdry, professor of anatomy, Dr. John C. Finerty, assistant professor of anatomy, Dr. William L. Simpson, research assistant in cytology, Dr. Mildred Trotter, professor of gross anatomy, Dr. John Van Dyke, assistant professor of anatomy, and Captain C. Y. Hsu, Major H. M. Liang, Dr. Chanai Ruangsiri, all postgraduate students.
Dr. E. V. Cowdry participated in a postgraduate course in the Medical Sciences, given by the University of Texas Medical School at Galveston, February 26-27. He also attended the annual meeting of the Board of Directors of the American Cancer Society held in Chicago March 6-7.

Dermatology

Dr. James Bagby, assistant in clinical dermatology, is Branch Section Chief for dermatology and syphilology for the Veterans Administration, which includes 10 hospitals, located in Kansas, Missouri, Arkansas, and Oklahoma.

Dr. Adolph Conrad, Jr., assistant in clinical dermatology, has been appointed consultant in dermatology for the Veterans Administration Hospital at Jefferson Barracks.

Dr. Clinton W. Lane, assistant professor of clinical dermatology, addressed the annual clinic conference of the Chicago Medical Society on March 4 on “Dermatitis of External Origin as Encountered in General Practice.”

Otolaryngology

Dr. French E. Hansel, associate professor of clinical otolaryngology, addressed the Wayne County Medical Society in Detroit, Mich., on “Recent Progress in Allergy,” and he spoke at the Southwest Allergy Forum in Freeport, La. on “Hay Fever” recently.

Dr. Lawrence R. Boies, professor of otolaryngology at the University of Minnesota, visited the Department March 20-21.

Dr. James B. Costen, associate professor of clinical otolaryngology, spoke on “Plasmacytoma, Report of a Case” at the American Laryngological, Rhinological and Otological Society meeting April 26.

Pathology

Dr. Gustave J. Dammin, assistant professor of pathology and medicine, and Director of the Diagnostic Laboratories in Barnes Hospital, attended the Surgeon General’s Medical Laboratory Conference in February as consultant to the Secretary of War.

As Technical Adviser on the Army’s Medical Laboratory Film, Dr. Dammin visited the Signal Corps Photographic Center in New York in February and March 14-17. On March 17, he reviewed the film with the staff of the Surgeon General’s Medical Laboratory and representatives from the Army Institute of Pathology and Army Medical School.
Dr. Robert Stowell, assistant professor of pathology, and Mrs. Stowell, returned in February from Sweden, where Dr. Stowell spent 10 months in the laboratory of Professor Caspersson.

Dr. Robert A. Moore, professor of pathology, attended a meeting of the Committee on Pathology of the National Research Council and a meeting of the Scientific Advisory Board of the Army Institute of Pathology in Washington, D. C. April 12-13.

**Pediatrics**

Five men from the department of pediatrics attended the 15th annual meeting of the American Academy of Pediatrics in Pittsburgh February 24-27. They are Dr. P. J. White, instructor in clinical pediatrics; Dr. Stanley Harrison, instructor in clinical pediatrics; Dr. Hugh McCullough, associate professor of clinical pediatrics; Dr. Bordon Veeder, professor of clinical pediatrics, and Dr. Joseph Jaudon, instructor in clinical pediatrics.

Dr. Alexis F. Hartman, head of the department, gave a series of talks in April. On April 7, he spoke to the Tennessee State Pediatric Society in Memphis, Tenn., on “Treatment of Infantile Diarrhea.” On April 16, he spoke to the Iowa State Medical Society at Des Moines, Iowa, on “Principles Governing the Choice and Parental Administration of Fluids.” On April 17, he spoke to the Iowa Pediatric Society on “Treatment of Meningitis.”

**Miscellaneous**

Dr. Arne Tiselius, professor of physical chemistry at the University of Upsala, Sweden, gave a special lecture in the Medical School Auditorium April 8 on “Recent Methods for the Analysis of Proteins and Amino Acids.”

Dr. Sol Spiegelman, assistant professor of bacteriology and immunology, presented “Gene Enzyme Problem” at Barnard Free Skin and Cancer Hospital February 24. Discussion was led by Dr. A. R. Gopal-Ayengar, research fellow in anatomy.

Dr. William Stanbro, assistant in radiology, presented a paper entitled “Cancer of the Body of the Uterus,” which was discussed by Dr. A. Norman Arneson, associate professor of clinical obstetrics and gynecology, and Dr. James F. Nolan, assistant professor of obstetrics and gynecology.
On April 14, Dr. Robert A. Moore, dean, spoke on the American Broadcasting Company network in the Lederle program "The Doctors Talk It Over." Dr. Moore and Milton Cross discussed "Clinical Pathology."

Dr. Edwin Gildea, professor of psychiatry, and Dr. Fred A. Jostes, assistant professor of clinical orthopedic surgery, spoke at the National Council on Rehabilitation, which met in St. Louis April 29 and 30. Dr. Gildea's topic was "Mental Limitations" and Dr. Jostes spoke on "Preparation of Physical Disabled for Living."

Dr. Frank H. Ewerhardt, assistant professor of physical therapeutics, has written a new book entitled "Therapeutic Exercise," which has just been published by Lea and Febiger. An article by Dr. Ewerhardt, "Physical Therapy Measures," will soon appear in the publication A Women's Medical Advisor.

As a member of the American Bar Association's Committee on Judicial Selection and Tenure, Mr. William W. Crowdus, lecturer in medical jurisprudence, has recently made speeches in Omaha, Denver, and Colorado Springs on the Missouri Non-Partisan Plan.

Dr. Frank Bradley, director of Barnes Hospital, and Dr. Robert A. Moore, dean, visited the research laboratories at the Phillips Petroleum Company in Oklahoma March 14.
Publications by the Staff of the School of Medicine
October, 1946 - March, 1947


Hershey, A. D. Mutation of bacteriophage with respect to type of plague. Genetics, 31: 626-640, Nov., 1946.


Alumni News

1883
Enoch R. Weaver, who practiced medicine for 53 years, writes that he had to retire in 1936 because of defective hearing and eyesight, but is still in fair health. Dr. Weaver practiced at Charleston, Ark., for 39 years, and moved to Bristow, Oklahoma, in 1920, where he practiced medicine for 14 years. "I would be glad to hear from any of my class," he says.

1895
"I have many things I would like to write, but am too busy practicing medicine," Edwin C. Peelor says. "The heaviest work I ever did was 1945—my 50th year."

Dr. James H. McNutt passed away March 12, 1947, in Hammond, Ill., at the age of 77 years, after practicing in the Hammond community for 52 years. He served as Piatt County coroner for several years.

H. A. Geitz has been in Monterrey, Mexico, since 1928. He writes, "In good health and in medical practice. We have two fine modern hospitals. Our city has 250,000 inhabitants and is beautiful—located on a plain entirely surrounded by mountains. Wonderful climate. Greetings and best wishes!"

Newton T. Enloe's eldest son will finish medicine and join his father in practice on July 1 this year. Dr. Enloe is the owner, director and chief surgeon of the Enloe-Chico Hospital in Chico, Calif.

He is the owner and manager of a ranch, where he raises beef cattle to supply meat for his hospital, and keeps saddle ponies as a hobby. His latest acquisition is a yearling Hamiltonian colt from Missouri with which he hopes to open the eyes of Californian horsemen when he shows him, in the near future. Dr. Enloe was 75 years of age in February.

1896
Samuel J. Lewis, Columbus Junction, Iowa, passed away recently.

1897
Robert S. Yancey, Dallas, Texas, died February 21, 1947.

1898
Herman L. LeSaulnier says, "I would like to see a class reunion not too elaborate so most can stand the expense. Now 49 years of practice and six years of drug work before this and I am still alive."

1899
Jesse S. Hixon, San Angelo, Texas, died January 22, 1947.

1919
Edward A. Hashinger is professor of clinical medicine at the University of Kansas, Kansas City, Mo.

1924
Cleon E. Colgate is at the Veterans Hospital, Amarillo, Texas.

1925
James Knott is now in San Diego, California.

Omer M. Raines, who was in the Army Medical Corps at Fitzsimons General Hospital in Denver, Colo., from February, 1942, to December, 1946, is now doing general surgery in the National Reserve Building in Topeka, Kansas. While in the service, Dr. Raines did orthopedic and general surgery. He was a Major, M. C. He has a daughter, 21, who was married last August, and another daughter, 19, who is a junior at Kansas University.
Gershom J. Thompson returned to Mayo Clinic as head of the Section on Urology in March, after three and one-half years in the Navy.

James O. Noll has moved from Clay, Ky., to Marion, Ky.

Karl D. Dietrich is practicing in the Exchange Bank Building, Columbia, Missouri.

Earl L. Mills is now located in the K. F. H. Building, Wichita, Kansas.

A. W. Freshman is located in the Metropolitan Building, Denver, Colo.

Jesse Lester Henderson was released from the Navy May 1, 1946, after which he took his American Board of Psychiatry examinations and was certified. He is now in Seattle, Wash., where he is practicing psychiatry. He and three other psychiatrists, a psychologist, and a social worker comprise the staff of the Northwest Clinic of Psychiatry and Neurology in Seattle, Wash.

In February, 1945, he was married to Edith Christine Sharp. "The housing shortage is acute," he said, "but we found a house and eight acres across Lake Washington, in Bellevue, Washington."

Colonel Crawford F. Sams is Chief of the Public Health and Welfare Section, General Headquarters, Tokyo, Japan.

Craig B. Johnson is doing clinical work in ophthalmology at the U. S. Naval Hospital, Houston, Texas.

Donald F. Colburn returned to the practice of neurosurgery in Kansas City a year ago, after four years in the Navy Medical Corps.

Walter H. Matuska, a Lieut. Col. in the Medical Corps, is stationed at Letterman General Hospital, San Francisco, Calif.

H. B. Elkins is instructor in radiology at the University of Iowa.

J. Robert Cochran is in the Medical Arts Building, Ft. Worth, Texas.

Joseph E. Smadel and Elizabeth Moore Smadel are now in Silver Spring, Md.

Isaac Lorberblatt is in Brooklyn, New York.

William B. Adams is practicing anesthesiology in Muncie, Ind. He writes, "Julie L. Adams ('33) and I have four sons."

Raymond Francis Holden, Jr., returned to St. Louis in December, and is practicing in the Beaumont Medical Building, following service with the Army Air Forces as a Flight Surgeon with the rank of Lieut. Col. He was awarded the Army Commendation Ribbon during 1946 for work performed as Chief of Professional Services at the Boiling Field Station Hospital, Washington, D. C. He is Instructor in clinical medicine at the School of Medicine.

John D. Maddox was in the Navy from April, 1942, to April, 1946, serving with the rank of Commander. He has resumed his practice of EENT in Joplin, Mo. He was certified by the American Board of Ophthalmology in 1944.

Alva E. Miller is on duty at Fitzsimons General Hospital, Denver, Col., as assistant chief of the Neuropsychiatric Service. He is now in the practice of neurology and psychiatry.
1935

About April 15, 1947, Bernard Schwartzman expects to move into his new office suite in the Pasteur Medical Building in St. Louis. His practice is limited to pediatrics.

Bert Bradford, Jr., is practicing surgery in Charleston, West Va.

Tribute was paid to Ralph E. Crigler, Ft. Smith, Ark., surgeon, during a program on America’s “Big Little American Week” at the Fort Smith Boys’ Club one day last July.

Dr. Crigler, who is personal physician to over 1400 members of the Boys’ Club, was saluted by Mutual’s radio singer, Morton Downey, and the program was broadcast over 265 stations. He was presented with a “Big Little American” scroll which called him “Fort Smith’s most universally loved man.”

One of the featured parts of the program was an incident concerning a 13-year-old boy. The boy had a brain abscess, and his parents could not afford an operation. Dr. Crigler sent the boy to Roland M. Klemme (’21), who operated, and made no charge.

Dr. Crigler is president of the Board of Directors for the Boys’ Club. In 1941, the Chamber of Commerce and the Junior Chamber of Commerce presented him with a gold key as being “Fort Smith’s outstanding young man of 1941.”

Nathan K. Jensen is now in Minneapolis, Minn.

Robert L. Stephens is now in Orlando, Fla.

1936

Morris Berk (formerly Berkowitz) is taking a residency in medicine at the Veterans Hospital, San Francisco, under Stanford and the University of California Medical Schools. He was discharged from the army in May, 1946, as a Major in the Medical Corps.

“I would like to hear from classmates of 1936,” he writes.

J. Frank Trucks is in Birmingham, Alabama.

John L. Plymale is in Marion, Ohio.

Vernam T. Davis is in the Regular Corps of the U. S. Public Health Service as Chief of the Neuropsychiatric Service of the U. S. Marine Hospital, Ellis Island, N. Y. In December, 1946, he was certified by the American Board of Neurology and Psychiatry. Dr. Davis has been with the U. S. Public Health Service for 10 years, serving in assignments in psychiatry and hospital administration.

“At the present time I am living with Mrs. Davis, formerly Mary Hooper, R.N., Washington University, and our three children, Judith Anderson, born in Denver in 1939, John Terrell, born in Fort Worth in 1941, and Nancy Jean, born in Fort Worth in 1943,” Dr. Davis writes. “We live on Ellis Island where the light from the torch of the Statue of Liberty shines in our bedroom windows to the south, and the skyline of the Wall Street section of Manhattan gives the background to the view from our living room windows to the east. The Queen Elizabeth and the other liners pass on the southeast.”

Alexander Silverglade is in general practice in Los Angeles.

C. P. Platz returned from Japan in February 1946, was discharged from the U. S. Medical Corps, and is now practicing obstetrics and gynecology in Casper, Wyoming. His office is in the Wyoming National Bank Building.

1937

Gilbert S. Goldman is at present senior surgical resident at Montefiore Hospital, Pittsburgh, Pa., after spending five years in the army, 32 months
of which were spent in the ETO. He plans to spend the fourth year of his surgical residency at Mt. Sinai Hospital, New York.

T. E. Kircher, Jr., is practicing internal medicine and allergy in Albuquerque, N. Mex., following his release from the army. He was a Lieut. Col. in the Medical Corps.

1938

Lawrence M. Kotner is now practicing internal medicine in St. Louis, after 39 months overseas with an infantry battalion. He has two children, Carolyn Sue and Larry, Jr.

G. W. Blankenship is located on Highway No. 71 at Anderson, Mo.

Joshua Ernest Jensen went into the army as a member of the 70th General Hospital Surgical Staff, after completing a residency in surgery at the St. Mary's group of hospitals in 1942. He is now instructor in surgery at the St. Louis University School of Medicine. He has a daughter seven years of age, and a son three years of age.

Reuben R. Harris opened his office for the practice of general surgery at 1117 S. 20th St., Birmingham, Ala., on February 1.

H. D. Bingham works with his two brothers, one of whom is a dentist and the other an M.D. They have a medical-dental clinic in Richmond Highlands, a community about five miles north of Seattle. Dr. Bingham is the proud father of Stevie, born last September, and of Joanne, age five. He was discharged from the army in 1945. He received the Bronze Star.

Robert R. Robinson, Jr. is doing plastic surgery in University City, Mo., following his discharge from the service in September, 1946.

1939

R. H. Greeley is senior resident in urology at the Veterans Administration Hospital in Hines, Illinois.

A. Waite Bohne is with the Department of Urology at the University Hospital, Ann Arbor, Mich.

1940

R. N. Hirst is located in the Eccles Building, Ogden, Utah.

Summer B. Kingsley was discharged from the U. S. Air Forces in December 1945, upon his return from China. He is now practicing pediatrics in Ithaca, N. Y., after completing a residency in pediatrics at Strong Memorial Hospital, Rochester, N. Y. He has a daughter, Anne, six years of age.

Robert L. Garrett has been appointed senior resident in orthopedic surgery from July, 1947, to June, 1948, at Charity Hospital, New Orleans, La. He is now completing his second-year residency after being relieved from active duty in the Navy Medical Corps in February, 1946.

1941

Henry H. Caraco is in practice of internal medicine in Long Beach, Cal. He was in the service for three and one-half years, serving 15 months in Puerto Rico and 12 months in the European Theatre.

Alexander Ellman was separated from the service in November, 1945, after 38 months in the Southwest Pacific. He is now practicing internal medicine in Brooklyn, N. Y. He was married to Violet M. Noe of Boulder, Colo., in Sydney, Australia, in 1944.

Mathias F. F. Kohl is practicing obstetrics and gynecology in Akron, Ohio, after two years in the U. S. Navy.
1942

Ewald Busse has been made an assistant professor of psychiatry at the University of Colorado.

Edward O. Kraft is taking further training in anesthesiology after his discharge from the army in 1946. He is with the Department of Anesthesiology, Bellevue Hospital, New York City. He writes, "Hope to return to the Midwest at earliest opportunity."

Hanes H. Brindley is taking postgraduate work in Galveston, Texas, toward his master's degree in anatomy. He will be at the Campbell Clinic in Memphis, Tenn., on a fellowship in January, 1948.

1943

Louis A. Gottschalk is assistant surgeon at the U. S. Public Health Service, Fort Worth, Texas.

Jerry H. Allen, Jr. and Francis Fisher Allen (School of Nursing, 1945) are the parents of Jerry Harrison Allen III, born January 19, 1947, in Los Alamos, New Mexico.

John M. Arther III is taking postgraduate training in psychiatry and is a member of the staff of Spring Grove Hospital, Catonsville, Md. He was discharged from the army in August, 1946.

H. Clagett Harding has been practicing internal medicine as assistant to internist in Portland, Oregon, following his release from the army.

Elmer B. Miller is practicing surgery in Detroit, Mich. He was discharged from the army in October, 1946, after service in France, Germany, Austria, Philippine Islands, and Japan.

Daniel S. Castile is still on duty with the Air Force in Europe, but expects to be a civilian soon. He has been near Munich as flight surgeon for a year, following three months in Cairo, Tripoli, Rome, Gibraltar and Casablanca with a special project of the heavy bombardment group.

He writes, "Brett Daniel Castile and Mrs. Castile joined me in Munich in October. Brett is now a year old."

H. Graham Packer returned from the Pacific in September, 1946, and is now in general practice in Platte City, Missouri.

1944

Joseph C. Gallagher has been stationed in Germany for almost a year. He is a First Lieut. in the Medical Corps.

1945

Thomas G. Edison was transferred to the U. S. S. Pocomo following his internship at the United States Naval Hospital in Chelsea, Mass. He is now the ship's doctor.

1946

Kenneth Wood, who will be awarded his degree this year in England, has been a house surgeon at the General Infirmary at Leeds since he finished at the School of Medicine.

"This hospital is the main teaching center," he writes. "Until the National Health Service became imminent, the General Infirmary was the only teaching hospital apart from the women’s and maternity hospitals. Now, all the local hospitals are trying to become teaching centers, because as such, they will have preferential treatment under the new scheme.

"My appointment as house surgeon terminates in a few weeks, but I have learned a lot. My duties have corresponded to those of an assistant resident at Barnes.

"I understand that I shall be allowed a further six months before I have to do my turn of duty in the army. I am hoping to spend the time in the Receiving Room as Casualty
Officer. This will prove useful experience in whatever branch of medicine I choose. At the moment my inclinations are to surgery."

Dr. Wood commented that the floods in England this year are the worst for a hundred years. He said that people seem apathetic and tired due to the present economic crisis in England. He mentioned that he met an American in London recently who seemed very optimistic about England's future. "I hope he is right," he said.
WASHINGTON UNIVERSITY

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Joyce C. Stearns, Ph.D., Dean of Faculties

The College of Liberal Arts
William G. Bowling, A.M., Dean

The School of Engineering
Alexander S. Langsdorf, M.M.E., Dean

The School of Architecture
Alexander S. Langsdorf, M.M.E., Dean

The School of Business and Public Administration
Isaac Lippincott, Ph.D., Acting Dean

The George Warren Brown School of Social Work
Benjamin E. Youngdahl, A.M., Dean

The Henry Shaw School of Botany
George T. Moore, Ph.D., Dean

The School of Graduate Studies
Joyce C. Stearns, Ph.D., Dean

The School of Law
Wayne L. Townsend, A.B., LL.B., J.S.D., Dean

The School of Medicine
Philip A. Shaffer, Ph.D., Dean

The School of Dentistry
Otto W. Brandhorst, D.D.S., Dean

The School of Nursing
Louise Knapp, R.N., B.S., A.M., Director

The School of Fine Arts
Kenneth E. Hudson, B.F.A., Dean

University College
Willis H. Reals, Ph.D., Dean

The Summer School
Frank L. Wright, A.M., Ed.D., Director

Mary Institute, a preparatory school for girls, located at Ladue and Warson Roads, is also conducted under the charter of the University.

Note: Complete information about any of the schools listed above may be obtained by writing to the Dean or Director concerned.