internist acknowledging the significant value to clinical medicine and surgery of his biochemical investigations and that of a member of the medical faculty of Harvard Univeristy paying tribute to him as a stimulating teacher and leader and above all a wise, helpful and beloved colleague. Though I may not speak in mellifluous diction nor with the wisdom of the ages, I do speak with the authority of one who daily in my care of patients now for many years has utilized the methods that Dr. Folin perfected both for a better understanding of what ails sick humanity and as a guide in their therapeutic management and of one who for twenty-seven years has sat with him in faculty and committee meetings, somewhat bedevilled his peace and comfort when I used the laboratory over his head and above all in personal contacts learned to know the quality of his mind and the character of his personality.

You, my younger colleagues and students, scarce can vision medicine without the methods of blood analysis perfected by Folin and his pupils and those inspired by Folin's own accomplishments, so completely have these micro-methods of quantitative analysis become a factor integrated into the web and woof of the fabric of clinical medical and surgical lore. By such microchemical methods we follow the progress and guide the diet of those suffering from Bright's disease; using them for those approaching the period of the evils of prostatic hypertrophy, surgery has been made vastly safer; with their results at hand more successfully do we measure the needed insulin against the metabolic requirements for health in the diabetic and especially with them safely do we steer the diabetic between the Charybdis of acidosis and the Scylla of insulin shock; microchemical analysis makes possible the diagnosis of parathyroid tumors and allows the surgeon by their removal to cure serious bone disease or stay the formation in some of renal stones. Folin's studies and microchemical methods of analysis have granted us a better understanding of gout and enlightened us on the mechanism of edema in anemia, renal disease, circulatory failure and a large group of nutritional disorders.

Not all the methods have been the product of Folin's own hand or originated in Folin's laboratory, but it has been, however, from his own ingenious methods and the wisdom of his approach to important biochemical problems that has grown the whole range of microchemical analyses of the blood and other body fluids which are daily in use in hundreds of hospitals and thousands of doctors' offices the world over. He was the recognized leader in this phase of clinical laboratory technique, and some of his own methods are probably always in use, for, as it has been said of the British Empire that the sun never sets upon it, so the sun somewhere always is shining on the laboratory determining something in the blood of patients by a Folin method. As has the microscopist, so has Folin dealt with the very small, and his work has been determining accurately smaller and smaller amounts of various substances in the smallest possible bulk of blood or other body fluid. The ultimate in this would seem to be the determinations by Richards and his pupils of glucose, sodium chloride, urea, uric acid and creatinin in the fluid from a single glomerulus and from a single tubule of the kidney using micro-methods, based on Folin's investigations and perfected as a result of the guiding stimulus of Folin's work.

When Folin entered the faculty of medicine it was composed of just under 50 members. Of those men besides myself, only Cannon, Bremer, Lewis and Joslin remain in active service. We are Folin's oldest faculty friends and longest have had the stimulus of his work and his ideals, the benefit of his wisdom and the fellowship of himself. In this we have been particularly the elect, but in these intervening years many others have come to share him with us, until last year his influence was felt by 130 faculty colleagues.

Folin now is a fine tradition in the Harvard Medical School not alone to the faculty but to the members of twenty-six classes of medical students that in his laboratory have been instructed in biochemistry; his personality, his character, his wisely critical attitude toward men and their investigations, his friendly helpfulness to others, the restraint of his spoken word not failing in clarity, his modesty, his sense of humor and other qualities have endeared him to us.

In his death we have lost a truly wise colleague, who was an ideal professor. Long will the memory of him remain a potent factor in our individual activities. That he lived and worked here among us is a cause of deep gratitude in the hearts of each and all of us, faculty and students of the Harvard Medical School.

HENRY A. CHRISTIAN

SCIENTIFIC EVENTS

THE CONSTRUCTION OF A BARRAGE ACROSS THE TIGRIS

THE construction of the barrage across the Tigris at Kut has been inaugurated by the Government of Iraq. The consulting engineers for the works are Messrs. Coode, Wilson, Mitchell and Vaughan-Lee, Westminster, and the contract was awarded in September to Messrs. Balfour, Beatty and Co., Limited, who expect to complete it within three years. Ac-

cording to the London *Times,* the estimated cost is over £1,000,000.

The plan provides for a barrage and a navigation lock on the Tigris at Kut and, higher up the river, a head regulator and a canal through which the waters of the Tigris will be diverted as required into the Shatt-el-Gharraf. This river, the course of which is southward to Nasiriyeh, on the Euphrates, at present runs dry when the level of the Tigris is low in the summer season, and the object of the works is to ensure a continual flow of water throughout the year. With the installation of pumps it will thus be possible to irrigate an immense area of land which, properly watered, has rich possibilities for the production of wheat and maize and cotton.

The barrage will be nearly 2,000 feet long with its approaches and will have 56 openings, each nearly 20 feet wide, controlled by sluice gates. Its height will be nearly 50 feet from the bottom of its concrete base to the road along the top. This road, 13 feet wide, will serve as a much-needed public bridge. The navigation lock will have an effective length of 260 feet and a width of 53 feet, and as the Tigris is used extensively by a species of salmon, a fish ladder, the first structure of its kind in Iraq, will be embodied in it, to allow the passage of fish up the stream. The Shatt-el-Gharraf Canal will be 3,250 yards in length and 90 yards in bed-width.

The Tigris Barrage is one of the three big irrigation works included in the Capital Development Works program of the Government of Iraq, which, originally in the nature of a five-year-plan, was passed into law in 1931. The first of these projects was the Habbaniyah Escape, one of the principal irrigation schemes proposed by the late Sir William Willcocks some years before the war. Its primary object was to provide an escape for the spring flood of the Euphrates by diverting it into the Habbaniyah Lake on the right bank of the river between Fallujah and Ramadi, at the upper end of the cultivable lands. The water level in the river then could be controlled south of Ramadi and thus the flooding of the river year by year, with the consequent heavy damage, would be almost entirely eliminated. The other scheme is the Abu Ghuraib Canal, a smaller operation, which is now under way. The line of this canal runs from the left bank of the Euphrates about six miles below Fallujah towards Baghdad. It is 40 miles long and is expected to water about 120,000 acres.

The Government of Iraq also contemplates the erection of a dam on the River Diala, at a point where it passes through hills about 70 miles north-east of Baghdad. The effect of this work would be to form a reservoir capable of raising the river's level in the summer months and thus of irrigating 1,500,000 acres of land suitable for cotton and wheat between Diala and Kut, the cost of which would probably be more than £1,000,000.

THE DROUGHT AND AUTUMN RAINS

OVER most of the interior states, the three fall months changed completely the weather picture of the preceding winter, spring and summer, so far as moisture is concerned, according to a statement made by J. B. Kincer, of the U. S. Weather Bureau. In many areas where unprecedented drought had hung on from the first of January until the last of August abundant rains fell in September, October and November. Even with the heavy fall precipitation, however, subsoil moisture remains deficient and the average rainfall for the year is bound to be below normal in many sections where the drought was most severe.

Above-normal temperatures in every state also distinguished the autumn of 1934. Very rarely are all the states on the same side of the normal temperature mark at one time. As a rule when one part of the country is warmer than normal, some other part is colder than normal.

The fall rains that turned the tables in the heart of the drought area brought approximately one and a half times the normal precipitation to states that for the preceding eight months had averaged about one half of normal. Thus, in Iowa precipitation was only 65 per cent. of normal for the eight months from January through August, but rose to 150 per cent. for the three-month period from September to November. In Nebraska the corresponding change was from 50 to 103 per cent.; in Kansas, from 57 to 134 per cent.; in Missouri, from 59 to 164 per cent., and in Illinois, from 67 to 154 per cent. The average precipitation for the year so far—which Mr. Kincer states is not likely to change materially between now and January 1, 1935—is 86 per cent. of normal for Iowa; 69 per cent. for Nebraska; 75 per cent. for Kansas; 85 per cent. for Missouri, and 90 per cent. for Illinois.

While the Middle West and the Central Valley were being well watered the eastern Ohio Valley was dry. Ohio, after a moderately dry summer, had only 80 per cent. of normal rainfall for September, October and November. The far Southwest and the northern Great Plains also continued dry through the fall. North Dakota, for example, had only 68 per cent. of its normal precipitation, following a 52 per cent. normal rainfall for the preceding eight months. This means an average annual rainfall of just a little more than half normal for North Dakota.

The Southwest started the year dry and stayed dry. Colorado had 67 per cent. normal rainfall from January through August and 62 per cent. for the rest of the year. In Utah the corresponding percentages were 63 and 90; in Arizona, 81 and 54, and in New Mexico, 69 and 66.

Fall rains were abundant in the Middle Atlantic States and in the Mississippi Valley States. Several of these had approximately one and a half times their normal precipitation—Wisconsin, 170 per cent. of normal; Maryland, 164 per cent.; Virginia, 152 per cent., and Mississippi, 148 per cent.