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PERCY LAVON JULIAN
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A Biographical Memoir by

BERNHARD WITKOP

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Percy L. Julian

PERCY LAVON JULIAN

April 11, 1899–April 19, 1975

BY BERNHARD WITKOP

Deep in the intricate country of the mind
I took a twisting path that led me stumbling
To a wind-racked hill.
Those thickets, briary, tough to break
And swampy sometimes underfoot
Were well behind me now
Lost to sight and for the moment
Lost to mind.
The hill I had reached was high enough
To look on distances that dropped away fold upon fold
Melting far to the Westward into a dim horizon
They beckoned me.
And my feet, so heavy as I had begun to climb the hill
Were now uplifted to lighter pace,
What land is this, I asked, in taking breath,
What lies behind that seventh fold?
Take heart, I told myself,
Go farther on.

DONALD ADAMS
The Seventh Fold

WHENEVER PERCY JULIAN told his friends about his life, and how he had overcome all the obstacles from his beginning as the grandson of a slave, born "at the corner of Jeff Davis Avenue and South Oak Street in Montgomery,

Alabama, the Capital in the cradle of the confederacy,"* to scientist, inventor, business leader, humanist, protagonist of human rights, he liked to illustrate this long arduous climb by Donald Adams' *The Seventh Fold*:

> My dear friends, who daily climb uncertain hills in the countries of their minds, hills that have to do with the future of our country and of our children, may I humbly submit to you, the only thing that has enabled me to keep doing the creative work, was the constant determination: Take heart! Go farther on!†

This imperative, *go on!*, characterizes not only his life but his research, where each answer created at least two new questions and led to the exponential growth of science as Percy experienced it in his lifetime. With this growth, he later realized the concomitant responsibility and questions of ethics.

Percy Julian was born on April 11, 1899, the oldest of six children of James Sumner Julian, a railway mail clerk, and his wife, Elizabeth Lena Adams. Since 1976 his birthday has been a holiday for the Village of Oak Park, a fashionable suburb of Chicago where the Julian family has resided since 1950, initially under precarious conditions (the Julian home, the first in the neighborhood to be owned by a black family, was the victim of arsonists on Thanksgiving Day, 1950, and the target of a dynamite bomb on June 12, 1951), and where other famous people, such as Ernest Hemingway and Frank Lloyd Wright, had their residences. Because Percy's father was a federal employee, the family held a higher status than most blacks of that day. This advantage, and the fact that his well-read father had a great love for mathematics and philosophy, helped him on the way to a formal education.

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*Percy Julian, "Response," in *Percy Lavon Julian, A Tribute* (Jacksonville, Illinois: MacMurray College, 1972), p. 23.

†*Ibid.*, p. 28.

Clearly, his must have been "a mind forever voyaging through strange seas of thought" (Wordsworth), or "a restless curiosity about things which he cannot understand" (Pascal), but the cultural and, above all, religious tradition in his family provided not only a repository of substantive values, but also a coding device for new ideas and achievements. That "the fear of the Lord is the beginning of all practical wisdom" was taught him, and not in Latin, by his revered paternal great-grandfather.

> My children and my friends all know him as Grandpa Cabe because they've heard me speak about him so many times. My great-grandfather, with the rest of us that day, was singing in the cotton field, where we children, particularly Dr. James Julian, my next brother, and I were sent to my grandfather's farm to work during the summer. We were singing on that day a beautiful spiritual, "There is a balm in Gilead to make the wounded whole. There is a balm in Gilead to heal the sin-sick soul."
>
> "Grandpa Cabe," I asked, "what's a balm in Gilead?"
>
> "Well, Sonny, you see, Gilead was a famous town in Israel for the manufacture of salves to heal wounds and sores," he told me. "And they called these salves balms. Now one day Jeremiah was having a hard time trying to lead his people the right way. Everything was going wrong for Jeremiah, and he cried out in anguish, 'Is there no balm in Gilead?' You see, what he was saying was, 'Ain't there no way out?' I want you to know that, Sonny, because I believe there is always a way out."
>
> It was then that I made my vow—that I would forever fight to keep hope alive because there is always a way out . . . .
>
> His optimism was one of the most pertinent lessons I learned as a youngster. Next to my parents and my grandparents, I owe my eternal optimism to my students and my co-workers, who over the past forty years have worked with me, and to my great-Grandpa Cabe.*

Respect for the dignity of the poor and survival with dignity came naturally to the Julian family as the results of hard work, family pride, love, acceptance, belonging, high moral

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**Ibid.*, pp. 24-25.

standards, good parental example, decent food, discipline, respect for authority, and God-centeredness. The major weapon for liberation was faith in education, the door that led from alienation to emancipation.

Percy often compared his fortunate family and his upbringing with the situation today:

> The kind of hope I grew up with is missing in today's ghetto youth because of a breakdown in family life. It has its roots in slavery when often the father of the family was uprooted and sold down the river. The son would grow up and get married and, when he was unable to get a job because there were not jobs for a black man, he would get embarrassed that he could not support his family and walk out thinking, "my mother did it alone and my wife is no better." Well, that went on generation after generation, and it's no better today. There still are no jobs and welfare encourages the man to leave the family. One of the greatest problems facing the country is how to reconcile the young ghetto dweller with the rest of America. We have a large problem of ignorance, lack of opportunity, and divided families. I worry about how we are going to solve it. It's not just trying to persuade people to be nice and understanding. I've been as angry as anyone else. But most people define the end of anger as when you become well-off. I think as we resolve the breakdown of the black family, caused by slavery and continued by welfare, the problem will come closer to its solution.*

Public education for blacks in Alabama stopped at the eighth grade. Traveling on an empty stomach, Percy made the long trip from Montgomery, Alabama to Greencastle, Indiana, where "because of the meager quality of my early training I was enrolled at DePauw University as a 'subfreshman' until nearly my senior year in college. On my first day in College," Percy liked to tell, "I remember walking in and a white fellow stuck out his hand and said, 'How are you?—Welcome!' I had never shaken hands with a white

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*Quoted in: William Montague Cobb, First Percy L. Julian Memorial Lecture, DePauw University, April 28, 1977.

boy before and did not know whether I should or not. But you know," he added smilingly, "in the shake of a hand my whole life was changed, I soon learned to smile and act like I believed they all liked me, whether they wanted to or not."*

He lived in the attic of a fraternity house. His support and tuition came from his earnings as a waiter. Often he worked as a ditchdigger during the day and attended classes in the evening.

Percy often related this early college experience with loving detail. Much later he started writing his memoirs in which the journey to Greencastle and his entry into DePauw forms the first and, alas, last chapter of an autobiography that would never be completed.

Later the entire family moved to Greencastle, and his two brothers, James and Emerson, and each of his three sisters, Mattie, Irma, and Elizabeth, in due turn graduated from DePauw University.

Before he received his A.B. in 1920, he had been elected to Phi Beta Kappa and became the valedictorian. Then his respected teachers informed him there were no opportunities for those of his color, and they could not help. Percy responded by going first to Fisk University, from 1920 to 1922, as an instructor in chemistry and then to Harvard, where as an Austin fellow, he obtained his master of arts in 1923. Through Harvard Fellowships for Studies in Biophysics and Organic Chemistry, he was able to investigate the chemistry of conjugated unsaturated systems with Professor E. P. Kohler. But even Harvard in those days was unable, or unwilling, to offer a Negro a faculty position. To Percy, the realization of this failure was not only discouraging, it was

Ibid.

traumatic. Instead, he went to West Virginia State College, at that time an all-black institution, to teach as a professor of chemistry from 1926 to 1927. John W. Davis was president of the College at the time.

Little did Percy know that forty-five years later, on May 12, 1972, he would meet his old "boss," then three times retired, at the dedication of the Percy Lavon Julian Laboratory at MacMurray College in Jacksonville, Illinois. It was a festive occasion that none of the participants would ever forget.

Davis, whom Percy called "a great educator, one of the greatest men I've ever known," had come to the dedication from Englewood, New Jersey, where he headed a fund for the training of Negro lawyers in the South, in honor of his former colleague's greatest moment. Dr. Davis related that at the end of his tenure, West Virginia State College had turned from 100 percent black to 70 percent white—completely and happily integrated. Percy at this point turned to a young assertive black student:

> I am telling you that this is a wonderful time to be living—a day of great opportunity. The country has changed course. Don't nurse your anger, but get together and help make this a really united nation.
>
> You know, I first spoke at MacMurray College in 1948. After my lecture everyone went to the Dunlap Hotel for the night. I was late getting away from the auditorium and by the time I joined the others, the management met me at the entrance. "The others have rooms," they said, "But we don't take coloreds. We have a train reservation for you back to Chicago." But, the Dunlaps and I are old friends now and this time they are giving me a party. I think it's a kind of formal apology.*

Percy Julian's commitment to the integrity of his group remained undiminished, but time and again he gave us reason to admire him for overcoming and sublimating the tension between the particularist and the universalist ele-

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*Remarks on the occasion of the "Tribute," MacMurray College.

ments in the value system of a man with such a steep and spectacular career. One of his closest friends, Archibald J. Carey, Jr., judge of the Circuit Court of Cook County in Chicago, for this reason, in a eulogy at his funeral, described him as "the most complete human being I have ever known. A man who made contributions to healing, not only of the body, but of our society where he has built bridges between many people and groups." His nineteen honorary degrees, his eighteen academic and civic citations, his twenty-nine involvements as a trustee, chairman, or member of educational, religious, and civic activities amplify and illustrate Judge Carey's statement.

Now comes a "change of venue," to stay within judicial terminology, so unlikely and so unique that Percy Julian was probably the only grandson of a slave who, in his time, not only went to Harvard from Montgomery, Alabama, but on to the former imperial capital of Vienna. This return to the Old World was prompted by a fellowship from the Rockefeller Foundation which he received while on the faculty of Howard University. Percy selected Vienna because the chemistry of natural products fascinated him, and Ernst Späth's research on alkaloids had attracted his attention. But in the back of his mind there must have been other thoughts and associations: the historic tradition of the world's musical capital, the elegance, the proverbial Viennese charm, the opera, and *der Heurige*. Percy never elaborated on his method of selection.

There was of course the memory of that picture in the house of his youth. It showed a valley surrounded by high hills—in the middle of it stood an old man and a little boy. The man was pointing to the mountain and the title of the picture was: *There are people over those mountains*. Percy, in life and in science, was always driven by a holy curiosity to know what is on the other side, in this case, of the Atlantic.

We are fortunate to be able to draw upon the personal memories of his closest Viennese friend, Edwin Mosettig, a fellow chemist, slightly younger than Percy, and brother of Erich Mosettig (1898–1962), both from Späth's laboratory.

Percy's arrival in Vienna in the fall of 1929 had elements of the story of the three Magi, he being the black king. He brought gold, in the form of dollars, to impoverished Austria. Instead of myrrh and frankincense, he had large crates shipped to Späth's laboratory on Währingerstrasse 38, the contents of which were marveled at by all the students. The boxes contained treasures of ground glass equipment, elaborate laboratory glassware (mostly made to order), electric stirrers, and other extravagances not known to the average student. Percy's good humor and friendly personality conquered all hearts in no time. His only reservation was toward Edwin Mosettig, later his most intimate friend, because in steady discussions with Percy's predecessor, Stephen Foster Darling from Harvard University, Edwin had adorned his English with an American accent to such an extent that he aroused the suspicion of Percy. Edwin told him that his predecessor had always defined "English as an American dialect."

Percy perfected his German in no time. He even became fluent in Viennese, a talent he used on the occasion of a taxi ride from the airport to his hotel when he revisited Vienna after the war. The taxi driver literally "took Percy for a ride," and first went on a great detour to the Prater. All of a sudden his American fare was heard to ask: "Ja herens, wo samma denn eigentli [Now listen, where are we actually]?" The driver was scared to death and immediately headed for the Hotel Sacher.

His linguistic perfection became known, and he received an invitation for a radio presentation. He chose a reading of poems and thoughts by Anton Wildgans (1881–1932),

director of the Burgtheater and noted poet, whose slightly melancholic, socially perceptive and critical writings, and melodious style impressed and attracted Percy. He felt Wildgans' *Grosse Österreich-Rede* addressed the notion that Austria is not a nation of fiddlers and dancers, but a stepchild of history punished by wars, depressions, and unemployment. The sample poem which he read illustrates the other view, the blessings of this country:

ÖSTERREICHISCHES LIED

Wo sich der ewige Schnee
spiegelt im Alpensee,
Sturzbach am Fels zerstäubt,
eingedämmt Werke treibt,

wo in der Berge Herz
dämmert das Eisenerz,
Hammer Gestein zerstampft,
zischend die Schmelzglut dampft,

wo durch der Ebene Gold
silbern der Strom hinrollt,
Ufer von Früchten schwillt,
hügelan Rebe quillt,

Pflügerschweiss, Städtefleiss
hat da die rechte Weis'
was auch Geschick beschied,
immer noch blüht ein Lied.

Österreich heisst das Land!
Da er's mit gnädiger Hand
schuf, und so reichbegabt,
Gott hat es liebgehabt!*

Franz Grillparzer's (1791–1872) ominous prediction, "from humanity to nationality to bestiality," set the fateful stages in the sequence that culminated in the events of World War II. All this struck a familiar chord in Percy, even one decade ahead of the events.

Percy cultivated his musical talents by receiving piano lessons from Edwin Mosettig's mother, a well-known teacher in the Theresienstrasse, where he was treated like a member

*Ludwig Reiners, *Der ewige Brunnen* (München: Verlag-C. F. Beck, 1955), p. 485.

of the family, participating in family outings, musical soirées, swimming in the Danube, tennis, and even one bold skiing excursion to the Rax Mountains, not to be repeated. Percy felt intimidated by all the proficient skiing experts. However, he practiced his tennis to the point where he defeated his friend Edwin more or less routinely.

The place where Percy "held court" by giving very generous receptions was an elegant apartment in a famous location: an der Strudlhofstiege, later the title of an 800-page best-selling novel by Heimito von Doderer (1896–1966) describing the social changes in Austria before, during, and after World War I. From his dwelling he could easily walk within minutes to the Boltzmann Gasse where the Chemische Institut was. Equally close was Frau Dr. Neumann's "Mittagstisch" where a select group of friends and prominent people used to partake of an elaborate luncheon à la Viennoise.

His social contacts were preferably with the leading intellectual and literary Jewish families of Vienna, such as the Polgars and the Lederers. Jewish solidarity and loyalty *(ahavath Yisra'el)* probably reminded him of his own minority and their comparable determination to survive.

His first opera was *Die Zauberflöte*. A normal student could only afford a *stehsitz* on the *galerie*, with no view. For music fans this did not matter; they followed the miniaturized score with the help of a flashlight and hardly looked at the stage. But Percy had tickets for an expensive loge (box) and invited Edwin to share it, who in this way *sat* through his first opera. Percy was elegantly dressed in a long black opera coat and homburg. He followed the complicated plot most attentively and was very receptive to all the special effects, such as the three protective graces who descend to the stage held by invisible ropes. "Well done, well done," was his repeated enthusiastic response.

To Edwin he confided many of his innermost thoughts,

for instance the traumatic memory of his disappointment at Harvard, where instead of a teaching position he received a citation. Percy, in front of all the students, according to Edwin Mosettig, walked up to the dean, shook his fist and exclaimed: "I do not pray for mercy, I want justice!" This story was told and retold many times with much anger and emotion. Whether this incident really happened that way, and there are doubts, or whether it was a projection of a mind under stress, in the end probably makes little difference.

Percy impressed his Viennese fellow students not only with the spirituals he played on the piano, but also with his passion for hard work and study, his profound chemical knowledge, and his astounding memory. Professor Ernst Späth, a critical, pitiless examiner, a teacher who ignored lazy or untalented students, characterized Percy in these words: "Ein ausserordentlicher Student, wie ich ihn in meiner Laufbahn als Lehrer niemals hatte [An extraordinary student, his like I have not seen before in my career as a teacher]!"

The preparation for the *Rigorosum*, or Ph.D. examination, was done *in clausura* with Edwin Mosettig in the scenic *Wachau*. His thesis was on the alkaloids of *Corydalis cava*, a plant growing in the *Wiener Wald*. This work had a decisive influence on his extensive later studies, all synthetic, on indole alkaloids and tryptophan metabolites.

In the postwar misery, Percy revisited Späth's widow, who was then eking out a marginal existence on a state pension. He managed to provide her with enough precious coal so her body—and her heart—kept warm all through the following winter.

In the sixties he passed Vienna again on the way to Budapest to negotiate some patent matters. He was invited to give an address over Radio Budapest. After a lengthy introduction in Hungarian, Percy's suspicion was aroused. He demanded a literal translation. After much hemming

and hawing he guessed from their prevarications that he was announced as one of the leading American Negro scientists, who was still disadvantaged and suppressed by his capitalist fellow countrymen. Percy replied that he had no intention to betray his country and withdrew his talk.

Josef Pikl, another of his long-time Viennese friends and associates, provided this perceptive summary in a personal letter to me:

> The time spent in Austria had a great influence in developing the personality of Julian. For the first time in his life, he was completely at ease, no open or hidden barriers, really an equal among equals. He may have even enjoyed a standing a few notches higher than his friends. In the laboratory at Vienna, he was particularly noticed for his neatness, the cleanliness of his work bench, his ready and contagious laugh, completely uninhibited. All the fifteen other graduate students in the room were his friends. He loved the freedom in Austria so much that a year after his graduation, he returned for the Summer and we spent a few weeks cycling through parts of Carinthia and the bordering area of Yugoslavia. One incident from this time he recited with much glee. When in a remote country village of Austria a boy about 8 years old slowly sneaked up to him and rubbed his hand and then looked to see if the color came off. A group of boys who had never seen a black man, except a chimney sweep, wanted to know if the color rubbed off.

Yet all this happened in the lull before the storm that unleashed the furies of war and genocide.

After he received his Ph.D. in Vienna in September 1931, Percy and his Viennese friend Josef Pikl sailed to America on the *Queen Elizabeth* and started their long-term collaboration at Howard University. Two years later, some unfortunate intrigue forced them to leave and go to DePauw University.

At this juncture the steep career of Percy Julian, the scientist, began. The best account of this period was rendered by Max Tishler, one of his many friends and admirers, when he presented him with the Honor Scroll of the Chicago

Chapter of the American Institute of Chemists on November 13, 1964.

His important research work began at DePauw University, where he was invited in 1933 by the late Dr. W. M. Blanchard, professor and dean of the College of Liberal Arts, to teach the senior courses in organic chemistry. With Prof. Blanchard's aid and counsel, he inaugurated a program designed to help "bridge the gap between college and university." In place of the usual college senior courses in Qualitative Organic Analyses, Organic Syntheses, Identification of Organic Compounds, or Literature Studies, he boldly attempted a synthesis of these disciplines in the Senior Student's training. Each qualified Senior was given a fundamental research problem. The result was astounding, even to oldsters in such endeavors like Harry Holmes of Oberlin, who became a staunch friend. Thirty beautiful senior theses resulted in a matter of 4 years, and 11 of these led to publications in the *Journal of the American Chemical Society*. What is more significant, most of these publications read more like Doctoral dissertations than expanded senior theses.

At the same time that he was guiding this student work, he was setting a fast pace for his students in his own individual laboratory work. Together with a devoted friend and brilliant fellow-student from Vienna, Dr. Josef Pikl, whom he had invited and assisted in coming to America, he had inaugurated a vigorous program of work on the constitution and syntheses of certain plant alkaloids having an indole nucleus. The first of these undertakings was the total synthesis of the alkaloid, physostigmine, an important drug. In a series of five papers, published in the *Journal of the A.C.S.* with Dr. Pikl, he reported this synthesis.*

The pace of work and the research climate of that time come through in Dr. Pikl's memories:

Throughout the six years of our collaboration, we made a good team. Percy generated ideas faster than half a dozen people could critically review and test them. He also did most of the writing, did practically all of the analytical work, such as carbon-hydrogen analyses, and determination of active hydrogen with his Grignard machine, and helped with much of the dish-washing chores using a two foot diameter porcelain dish with hot

*Max Tishler, "Percy L. Julian, the Scientist," *The Chemist*, 42(1965):105-6.

sulfuric acid and nitric acid, unaware of the dangers of this method, outside of acid burns. When we were celebrating some progress or the receipt of a nice letter, we drove out about six miles to the crossing of the Transcontinental Route 40 where there was a small snack restaurant. Usually, however, we stayed up to 11–12 o'clock in the laboratory so that we heard some complaints of burning too much midnight oil!*

Tishler continued:

In a sense, this work was the turning point in his early career. In three papers, he had developed step by step the chemistry leading to his synthesis. As the fourth paper, describing the next to the last step, entitled, "The Synthesis of d,l-Eserethole" was about to be posted to the Editor of the *Journal*, there appeared the last of a series of ten papers by Sir Robert Robinson of Oxford on the identical subject. Since the synthesis of eserethole virtually completed, except for the resolution of the optical antipodes, the synthesis of physostigmine, it looked as though Julian would come in "second best," and no chemist likes to see the end goal of his most monumental effort achieved first by another, no matter how different the approaches and how equally novel the chemistry. What was more disturbing than the loss of priority was that Sir Robert's "d,l-eserethole" was quite different from the d,l-eserethole Julian was publishing—different in all its physicochemical parameters.

Firm in his conviction that the logic of his synthesis left no room for doubt, Julian altered his paper and added the following:

> In a series of ten beautiful papers, Robinson and his co-workers have described syntheses of compounds which they call "d,l-Eserethole," and "d,l-Esermethole." Their "d,l-Eserethole" is not the compound described in this communication as d,l-Eserethole, and the constitution of which can hardly be questioned. We believe that the English authors are in error, that the compound they describe as "d,l-Eserethole" is not the substance, and that we are describing for the first time the real d,l-Eserethole.

*J. Pikl 1977: personal communication.

Dr. Pikl was quite unhappy, for those were hard depression days in America, and if they were wrong, the sun would not soon shine upon two young, brash neophytes having the audacity to challenge so eminent a scientist. Moreover, in Europe the prospects of a young man were usually irretrievably ruined in such a case. The paper went to press, and by this time chemists on two continents held their breaths and many took sides. Even Prof. Kohler warned him, "I know you realize that you must be right in this cordial polemic or else it might lead to grave doubts concerning the authenticity of your future work." Here is the outcome of this challenge as published in Julian's fifth and last paper on the subject, entitled "The Complete Synthesis of Physostigmine":

> Physostigmine, the principal alkaloid of the Calabar bean, and long used as a drug, has, since its isolation by Jobst and Hesse 70 years ago, been the subject of numerous investigations. The determination of its constitution was rendered particularly difficult since its peculiar chemical structure found no analog in other plant products of known composition. . . . Shortly after promising experiments in the direction of (its synthesis) were under way (in our laboratories) the work had to be interrupted and could only be resumed recently. In the meantime, the first of a series of ten papers dealing with the synthesis of Physostigmine, by Robinson and his collaborators, appeared and seemingly proved convincingly that the (course) suggested in our formulas could not be realized in practice. Our experiments, nevertheless, were continued. . . led to the successful synthesis of d,1-Eserethole. . . .
>
> To our surprise, our (d,1-Eserethole) exhibited entirely different properties than those of a compound synthesized by Robinson and his co-workers and called "d,1-Eserethole." Likewise were all derivatives different. Inasmuch as our (optically) inactive material subjected to characteristic reactions of Eserethole of natural origin, yielded perfectly analogous results, we expressed the belief that our product was the real constitution. This is now proved conclusively by synthesis of 1-Eserethole, identical with the product of natural origin.

Telegrams of congratulations came from all parts of America, Europe, and Asia. A young chemist had made his mark, and how badly he needed

it, for DePauw was hard up for funds. Julian needed a job and a living, and American firms and universities with research facilities were reluctant to hire a man of color in those days.

And then came one of those bits of "accidental chemistry" referred to by Prof. Wittig. In attempts to isolate Geneserin, a companion alkaloid of Physostigmine, from the Calabar bean (*Physostigma venenosum*), Julian had first extracted the oil from this rather lovely bean. The oil had been washed with dilute acid and then with water, and was set aside wet. On examining it some weeks later, glistening small crystals had separated. They were carefully separated from the oil and found to be a hydrate, which upon losing its water, was again soluble in the oil. After careful recrystallization of the minute quantity of dehydrated material, microanalysis showed the formula $C_{29}H_{48}O$. A literature search showed that it was the sterol, stigmasterol, named after the plant *Physostigma venenosum*, from which Windaus and Hauth had separated it 29 years before.

About the time of Julian's isolation of the stigmasterol, Fernholz and Butenandt were publishing the first of their epoch-making papers on the preparation of certain sex hormones from this same stigmasterol which they had now separated from soybean oil. Julian wrote the Glidden Company asking for a 5-gallon sample of soybean oil. Imagine his surprise when a vice president of the Glidden Company called him on the long-distance phone, inviting him for an interview, and telling him he was being considered for a research position in Glidden's Soya Products Division in Chicago. The circumstances surrounding this call are of historical significance:

> The late Mr. W. J. O'Brien, Glidden Vice-President, tells the story that he had been attending a Board meeting of the Institute of Paper Chemistry at Appleton, Wisconsin. Julian was being discussed for a possible position on the research staff there, thanks to Dean Harry Lewis, who had accepted several of Julian's DePauw students for the Doctorate in Paper Chemistry. The hitch, however, was how he might fare in the community in view of an old statute on the Appleton city books that "No Negro should be bedded or boarded in Appleton overnight." After listening to the discussion, O'Brien said to himself, "If he is half as good as they say he is, I can use him at Glidden. I won't say anything about who he is: I'll just hire him. If I ask about it, get consent and he fails, it will be 'We told you so, Billy.' " So O'Brien slipped out to the telephone and called

Julian. After the interview, Julian was hired on the spot as Glidden's Assistant Director of Research of the Soya Products Division.

On arriving, in 1936, to take up his duties, Julian found that he had been given the title of Director of Research of the Soya Products Division of Glidden. A new plant for the efficient and near quantitative extraction of oil from soybeans had been built by Electro-Chemie in Hamburg, Germany, and was being erected at the Glidden plant. Julian's fluent German stood him in good stead as he had to consult with the large coterie of German technicians, and he was on "24-hour call." He had every reason to forget forever his stigmasterol in the hectic few years following. Here was a stupendous pioneer effort to exploit every ingredient of the soybean. . . .

In his more than 18 years at Glidden, all these problems were solved and the Soya Products Division became Glidden's most profitable single entity. Soya phosphatides became a large commodity on the market and virtually a monopoly of Glidden, culminating in Julian's development of an oil-free granular product stabilized against rancidity, and widely sold today as "Lecithin Granules," a good supplement. Glidden's soya oil became a preferred product. Durkee's edible emulsifiers opened up a new era in liquid shortening, and Julian found himself one day also Director of Research for the Durkee Famous Foods Division of Glidden, an added job, and importantly soybean meal became an ingredient of nearly all animal feed, poultry feed now containing as much as 35%. One of the most enthusiastic and hard-hitting crews ever to man an industrial laboratory in a young enterprise surrounded him. Names like Levinson, Wilhelm, Engstron, Oberg (now of Carnation Milk), Karpel, Circle, Bain, Malter, Cole, Meyer, Magnani, Iveson, Herness, Ryden, Printy, and others appeared on the more than 100 patents applied for.

O'Brien's protein plant became a reality, with Julian in the early days functioning as engineer, chemist, researcher, and salesman. Today that plant (now owned by the Central Soya Co.) produces about 40 tons daily, and the protein has a world-wide sale. This remains the world's first and largest isolation and production of a relatively pure vegetable protein on a massive scale. And there was no small amount of chemistry involved, the ultimate secret being Julian's laboratory adjustment of the size of the soya protein micelle or molecule to fit particular applications, entailing countless electrophoresis and ultracentrifugal studies.

But though it took Julian almost 4 years before he could return to his stigmasterol, the dogged persistence prevailed. Soybean oil contains only

0.2 of 1% sterols, of which only 18% is stigmasterol—it would take 1000 pounds of soybean oil to yield 2 pounds of stigmasterol. Obviously, so much precious oil could not be destroyed just for this purpose.

One day a worker in the plant called Julian, as chief "trouble shooter," to counsel on what was to be done with a 100,000 gallon tank of "purified" soybean oil into which water had leaked. "The tank," phoned the worker, "contains a mass of white solid." Remembering his DePauw experience, Julian was there in a matter of minutes, had the whole tank centrifuged, and came out with an oily mass containing about 15% of mixed soya sterols. A modification of this accidental procedure introduced into the oil refining soon found Julian producing 100 pounds of mixed soya sterols daily. This was in 1940, and the value of this daily by-product production, in terms of the sex hormones that might be obtained from it, was then about $10,000 daily, but who could devise a facile industrial process for producing the sterols, for synthesizing the hormones, and who could possibly use so much hormone—as much as 5 to 6 pounds daily?

Julian, however, was soon ozonizing 100 pounds daily of mixed sterol dibromides, the first time that so large an ozonizer had been industrially employed for a potentially dangerously explosive reaction. The result: the female hormone, Progesterone, was put on the American market in bulk for the first time, and other sex hormones soon followed.

If, at this time, Julian had yielded his innate desire to participate personally in research to the administrative duties of being director of research for the Soya Products Division, manager of the Fine Chemical Division, and director of research for the Durkee Famous Food Division, he would have been remembered long for his scientific accomplishments. But these responsibilities did not stop this research chemist; instead, dramatic developments in the steroid field stimulated an even greater power within him. In 1948, Hench and Kendall at the Mayo Clinic made the epochal discovery that cortisone, then called Kendall's Compound E, reversed the symptoms of rheumatoid arthritis, using cortisone synthesized for the first time by Sarett in the Merck Laboratories. Since cortisone is a steroid, Julian reacted quickly. Scarcely had the announcement of the Mayo Clinic been made, when Julian published a new synthesis for *Reichstein's Substance S*, which is also present in the cortex of the adrenal gland and which differs from cortisone in lacking only an oxygen atom in position-11. In contrast to the previous synthesis, Julian's procedure was practical and made Substance S available in commercial quantities. Substance S is still an important commodity, and Julian's process, which starts with 16-dehydropregnenolone,

is probably the most widely used for the production of hydrocortisone. It is marked by simplicity and high yields; I have been told that yields of 84% are obtainable.

In a series of patent applications, Julian reported improved syntheses of a wide variety of substituted Substance S compounds, which in turn can be converted microbiologically into the corresponding hydrocortisone derivatives. These include 16-Alkyl, 16-Hydroxy, 6-Alkyl and 6-Halogenated derivatives of Substance S.*

These were times of hectic activities, as a letter from Percy dated September 28, 1949 attests:

As you can no doubt imagine, during the past six months I have worked an average of fourteen to fifteen hours daily including Saturdays and Sundays on partial syntheses of cortical steroids. Most of my other work has received scant attention during this period, a circumstance which I must remedy at the earliest possible moment. Our communication on the synthesis of *Reichstein's Compound S* will appear in the October *Journal*. Gallagher's publication antedates ours as you have noticed from this month's *Journal*. You will also note, however, that he starts with what Fieser would call epipregnanolone (pregnane-3α-ol-20-one) while we begin with the cheap and readily available pregnenolone (5-pregnene-3β-ol-20-one). I presume that he secured his epipregnanolone from the accumulations from urine extracts. Theoretically it gives him an advantage in that he has something of a dress rehearsal for Compound E from desoxycholic acid (which is more closely related to epipregnanolone than to pregnenolone). Nevertheless, I completed just about a month ago a new procedure for preparing epipregnanolone from pregnenolone so that the former substance would be available in quantity, which is not the case at present. Our same synthesis has been applied to Cortisone, although we are not satisfied at the present time with certain phases of this latter synthesis so far as large-scale production is concerned. We have sent out for clinical investigation over six hundred grams of the three compounds, 17α-Hydroxy-progesterone, Reichstein's Compound S, and 4-Pregnene-17α,20β,21-triol-3-one (as well as its 20α isomer). As you can well realize the production of these compounds in these quantities has been no small job, especially when vigorous

*Max Tishler, "Percy Julian, the Scientist," *The Chemist*, 42(1965):107-11.

research was being prosecuted at the same time in order to clear up yields, and so forth, at every step.

Tishler comments:

In this course of his intensive steroid study, much new and valuable chemistry has been evolved, including new compounds and new reactions. Thus, in the synthesis of certain 16-Methyl-11-oxygenated corticoids (in which Merck has been interested) a valuable intermediate, 11-Keto-16-dehydropregnenolone, was first synthesized and patented by Julian. His celebrated 16,17-Epoxy-steroids have found wide use in steroid chemistry. His facile preparation of 21-Iodo-compounds; his reduction of the latter with sodium bisulfite; his chromous chloride dehalogenation of halogenated steroids; his reductive Raney Nickel dehalogenation of steroid bromohydrins, leading to new and widely-used methods of producing 17α-Hydroxy-steroids; his general method for introducing the diacetone side chain into the steroid molecule; his early use of steroid ketals as protected centers within the steroid molecule, leading to his facile synthesis of Reichstein's Substance S; his preparation and study of 4,5-epoxy-steroids and their conversion to 4-Halo-derivatives; his variety of steroids containing the diosphenol structure—these are but some of his "firsts" in the steroid field.*

From his association with Glidden to the presidency of an independent personal venture was a time of work and strain, as a letter dated July 22, 1957 indicates:

In the meantime—during the critical building years of Julian Laboratories, the last three years—I have had to become a businessman and have had very little time to devote to any researches other than our steroid researches with various clients, particularly with Smith, Kline and French Laboratories. Now that Julian Laboratories have become a success (for your confidential information our accountants have just given me our sales for the first 10 months of our fiscal year ending August 31st, and they show close to 1.5 million dollars), I am again able to turn back to some of the things which have interested me, of course, most of my life. I still am far from being out of the woods. I need more men badly, among them a good plant manager and good production superintendent, several research men, two more Ph.D.'s at least and three or four junior assistants, a new personal

* *Ibid.*, pp. 111-12.

research assistant, etc, etc. Incidentally, in this connection, I would appreciate it if you know of any young men who might like to join our organization. As you can probably imagine, we have a very ambitious research program going on in the steroid field, some of which will, no doubt, be published shortly, now that the necessary patents and the necessary protections for our clients have all been cared for. You may also be interested to know that we import from our plantations and our factory in Central America, Dioscorea root, process it into Diosgenin, and into 16-Dehydro-pregnenolone here at Julian Laboratories, and thus have become very competitive, and the field a bit overcrowded, we have enjoyed a very good business, and are looking forward to double our sales for the coming year, now that our raw material supply is adequate. I hope that in the not-too-distant future, you can visit our laboratories here and see our research and production set-up.

Tishler continued:

His studies on Yohimbine alkaloids include a facile synthesis of the Yohimbine ring skeleton as well as syntheses of Yobyrine, Yobyrone, Tetrahydroyobyrine and Ketoyobyrine. . . . [He synthesized] for the first time the elusive Oxindole-Acetic Acid. . . . [He devoted much thought] to the study of the metabolism of the amino acid Tryptophan in the animal organism, by synthesizing Oxindole-Alanine and Dioxindole-Alanine, and demonstrating that the latter is not an intermediate in the conversion of Tryptophan to Kynurenine. . . . his monograph on the Chemistry of Indoles, occupying most of Volume 3 of *Heterocyclics,* edited by Elderfield, is a classic reference work for students and investigators in this field. . . .

The words of an eminent chemist complete my portrait of Julian the Scientist: In presenting him for the honorary degree of D.Sc., at the Oberlin Commencement in June [1964], Prof. Luke E. Steiner of Oberlin tendered the following citation:

> In these days in which specialization sometimes seems to dominate, I have the privilege of presenting a man who illustrates the general usefulness of an educated mind. In sequence as chemistry teacher, teacher and researcher, researcher and administrator, and entrepreneur and researcher, Percy Julian joined several careers through his continuing interest in natural materials from plants.
>
> He demonstrated his chemical competence and creative imagination in applied chemistry by securing a number of patents

> for the making of desired substances from the plant products, but he also kept on publishing in pure chemistry an impressive series of papers on indoles, sterols and steroids, and conjugated systems. Finally, he founded two firms through which he could apply his scientific knowledge, inventive skill, and judgment to recover large quantities of intermediate substances from soya beans and other plants and to make from them hormones and other drugs at low cost. We honor him for his humane objectives.*

The memorial prayer for the dead begins in the Sephardic rite: "A good name is better than precious oil." Percy would have smiled at this attempt to associate his worldly success in Glidden's soybean oil operation with the sum of his qualities that made him a man of virtue, *arete* (excellence, valor, virtue, manliness, the sum of good qualities that make character), in the old sense, with an abiding and infectious faith in the old values. His was a concept of life of activity, the Aristotelian concept of eudaemonism, with reason forming the basis of human felicity and little room for hedonism where happiness is pleasure. By dwelling on the experience of his life we enhance our own.

Percy Julian the businessman was lovingly praised and characterized by Benjamin M. Becker, his lawyer and business counselor since 1945:

> It is often said that business is rough, tough, ruthless and heartless. Percy, "the man who never gave up" proved the American dream from obscurity to astounding business greatness, but with a heart. He helped employees with personal and financial problems and solved business problems without resorting to endless litigation; he never had a single lawsuit against his company. Charity knew no bounds in the hearts of Percy and his admirable wife Anna. When a new product had been developed and the marketing and pricing was under consideration, Dr. Julian would say: "Well, let's make it moderate, so that everyone who needs it may get it." When we discussed details with a buyer and Percy had made some over-generous

**Ibid.*, p. 112.

offer or concession, when we were alone, he would smile and say: "Ben, I don't mind making a profit, but I want them to make one too." So his count was moderated by his compassion.*

Percy's dear friend, the great historian and humanist John Hope Franklin, in his tribute at the Visitation (wake) preceding the funeral on April 23, 1975, gave moving expression to his admiration for Percy who in 1973 was honored, together with Anna Julian, for bringing to life the Legal Defense and Educational Fund in Chicago. "His wit and charm and grace made him one of the most 'clubbable' persons it has ever been my pleasure to know. He very much cherished the company of others, and others cherished his company even more, if such was possible."

Percy himself described his role as scholar and humanist in his acceptance address when he received the Chicago AIC Honor Scroll. His own words are an eloquent plea that to his friends and colleagues projects and preserves his memory. His body may be gone, but his spirit lives on in these words in which he expresses his apprehension on what Albert Einstein called our age: "Eine Zeit vollkommener Mittel und verworrener Ziele [A time of perfected methods and confused aims]":

> Where should the Scholar live
> In solitude or in society?
> In the green stillness of the country,
> Where he can hear the heart of Nature beat,
> Or in the dark grey town
> Where he can hear and feel?
> I'll make the answer for him
> And say: In the dark grey town!
>
> H. W. LONGFELLOW

*Benjamin Becker, remarks on the occasion of the Tribute to Percy Julian, MacMurray College, May 12, 1972.

Almost forgotten and seldom quoted today, this prophetic little poem strikes deep at the heart of the devoted scholar's worries in this age of megaton bombs, short-sighted specialists, panacea thinking, status-quo paralysis, and philosophical void. If Longfellow in his day feared that the obsession of the scholar with his particular discipline might make him deaf to the anguished cries of humanity for direction and purpose, he most certainly would be appalled at the detached clichés of over-specialization and lack of universal concern so pronouncedly characteristic of the "educated" men of our times.

If there were a time when we thought that our system of liberal arts education would guarantee us the safeguard of future generations, trained in the broad requirements for citizenship in a great democracy, our dreams seem to have been shattered. There is no shadow of a doubt that the overpowering motivation—and perhaps the creeping paralysis—in our education today is the *development* of marketable skills. It is indeed doubtful if such an over-emphasis in an educational system can develop that scholar who "can hear and feel that throbbing heart of man." . . .

Scientific research projects, some good and some poor, are being spawned and supported by ample funds in nearly every college and university, large and small. I think the end result will be good for our nation. My prime concern here is that the scientist, particularly the chemist, recognizes the magnitude of the responsibility resting upon his shoulders when the nation entrusts so much of its wealth in his hands. Shall we become, for example, so deeply immersed in a sea of 'sense reality' that we sap the vitality of scholarly probing in the deeper well-springs of human destiny? Is it not our mission, particularly as teachers and even as members of industrial groups, to encourage, participate in where possible, indeed to give of ourselves and our energies something toward creative imagination in the world of ideas concerning the Whole Man, man searching for that symphony of ideas about himself and human destiny, without which all our efforts are but feeble ripples upon a turbulent sea of world confusion? . . .

Dr. Robert Hutchins warns us that the grave problems facing humanity cannot be entrusted to men of fractional culture (scientists). Indeed, he calls this fractional culture, pseudo-culture in essence. Father Theodore Hesburgh of Notre Dame, in a *Saturday Review* article entitled, "Science Is Amoral; Need Scientists Be Amoral Too?," seriously poses the question whether "science and technology are getting out of hand,"

> Historians of tomorrow may well ask why scientists did not join the human race in our time when the opportunities were so great and the means at hand so magnificent.

What does all this mean to you and me of the world of chemistry? To begin with, I cannot, and I hope you cannot, accept the blank statement that "Science is Amoral." While this may be said of its methodology and specific aims at a given time, Science is something more than methodologies, symbolisms, and technological devices; it is vastly more than the creation of mere things; computers and mechanical robots are only incidental by-products of its spirit of inquiry. Science, like all man's noble endeavors, involves the whole personality of those who pursue it. To say flatly that Science is amoral is to separate this man-made discipline from man himself and from the destiny of man. . . .

The challenge to us in the great debate with Humanists is clear. Too many of us have been satisfied to seek Truth only through the medium of certain facets of our discipline. We should have been the strong right arm of the humanist, but for the most part, we have not carved a basic social philosophy out of our endeavors. And yet where would one find more appropriate experience for such a philosophy than ours, where we live amidst the incomparable beauty of Nature's truth, Nature's objectivity, Nature's solemn and honest justice, Nature's grand nobility and bigness where no smallness can prevail in either mind or matter, Nature's understanding and tolerance where even the lowliest creation—whether it be the bee or the lilies of the field—performs its functions with dignity and glory, Nature's understanding and delicate balance, where on the one hand microorganisms can bring about the most dreaded disease, and on the other, bequeath to us the wonders of penicillin and aureomycin. The plea of Father Hesburgh that more of us should join the human race has some justification in fact. We must give more of our understanding to those who struggle to reinstate the majesty of the human will in the conduct of man, even in the utilization of our own hewn-out Truth.

Unless we, who know better than most world citizens the horror of the mushroom cloud that hangs ominously over us, become active Humanists in word and in deed, we may well condemn our world to awake some day never to view again the "green stillness of the country where we can hear the heart of Nature beat," but instead to crawl about and gasp for breath on limited terrain, surrounded by lakes and seas of molten lava, representing

the remnants of that which once we knew as Mother Earth. Then may we in sad humility remember the words of the prophet:

Behold this beautiful land which the Lord, thy God hath given thee!*

I AM DIRECTLY and personally indebted to Mrs. Anna J. Julian, Dr. Julian's widow; to Joan Bowman, his long-time secretary; to Dr. Josef Pikl; to Dr. Edwin Mosettig, Vienna; to Judge Archibald J. Carey; and to Dr. Max Tishler, Wesleyan University, for giving their thoughts, memories, records, and devotion to this obituary. Too many of Percy's close friends and collaborators contributed indirectly, and only lack of space, but not lack of gratitude, prevents individual mention. The first Percy L. Julian Memorial Lecture was delivered by William Montague Cobb, the distinguished educator, anthropologist, author, and humanitarian, at DePauw University on April 28, 1977, under the title, "Onward and Upward." The second Percy L. Julian Memorial Lecture, "The Humanist as a Chemist," was given by B. Witkop on May 4, 1978.

The magnificent portrait of "Grandpa Cabe" is part of Percy Julian's "Response" to the tributes paid to him by educators and scientists on the occasion of the dedication of the Percy Lavon Julian Laboratory at MacMurray College, May 12-13, 1972.

"Percy L. Julian, the Scientist," was the address delivered by Max Tishler when Percy Julian received the Honor Scroll of the Chicago AIC Chapter, November 13, 1964, in Chicago (see *The Chemist*, 42[1965]:105-13). In the same March issue is Percy Julian's response, "The Chemist as Scholar and Humanist." (pp. 101-4).

W. Montague Cobb set a monument to his lifelong friend in *Medical History*, 63(1971):143-50; 162 references.

*Percy L. Julian, "The Chemist as Scholar and Humanist," *The Chemist*, 42:101-4.

HONORS AND DISTINCTIONS

HONORARY DEGREES

D.Sc., DePauw University, 1947
D.Sc., Fisk University, November 1947
D.Sc., West Virginia State College, 1948
D.Sc., Northeastern University, Boston, October 1948
D.Sc., Morgan State College, Baltimore, June 1950
D.Sc., Howard University, Washington, D.C., June 1951
D.Sc., Northwestern University, Evanston, June 1951
D.Sc., Lincoln University, Philadelphia, April 1954
D.Sc., Roosevelt University, Chicago, September 1961
D.Sc., Virginia State College, Petersburg, May 1962
D.Sc., Morehouse College, Atlanta, Georgia, June 4, 1963
D.Sc., Oberlin College, Oberlin, Ohio, June 1964
LL.D., Lafayette College, Easton, Pennsylvania, September 1968
L.H.D., MacMurray College, Jacksonville, Illinois, June 1969
D.Sc., Indiana University, Bloomington, Indiana, June 1969
D.Sc., Michigan State University, East Lansing, Michigan, June 1972
LL.D., Atlanta University, Atlanta, Georgia, May 1973
LL.D., Illinois State University, Normal-Bloomington, Illinois, May 1974
D.Sc., Lincoln University of Missouri, Jefferson City, May 10, 1975 (posthumously)

ACADEMIC AND CIVIC HONORS

Spingarn Medal Award, National Association for the Advancement of Colored People (NAACP), June 27, 1947
Distinguished Service Award for 1949-50, Phi Beta Kappa Association of Chicago Area, December 1949
"Chicagoan of the Year" Award, *The Chicago Sun-Times* and Junior Chamber of Commerce, January 1950
The Coveted "Old Gold Goblet" Award, DePauw University, 1951 (For Distinguished Service as an Alumnus, given to only one alumnus annually)
Centennial Distinguished Citizen Award, Centennial Convocation, Northwestern University, Evanston, Illinois, December 2, 1951

Distinguished Merit Award for 1950, Decalogue Society of Lawyers, Chicago, March 3, 1951
Social Action Churchmanship Award of the Congregational Christian Churches of New Haven Conference, 1954
Jesuit Centennial Award as One of One Hundred Outstanding Chicagoans, December 12, 1957
Layman of the Year Award, Church Federation of Greater Chicago, April 23, 1964
Annual Silver Plaque Award, National Conference of Christians and Jews, Chicago, May 27, 1965
Founder's Day Award, Loyola University, Chicago, October 31, 1967
Merit Award of the Chicago Technical Societies Council, Chicago, November 14, 1967
Chemical Pioneer Award, American Institute of Chemists, Atlanta, May 11, 1968
Citation from the Mennonite Hospital, Bloomington, Illinois for Outstanding Contributions and Services to Mankind, January 24, 1970
Elected as a Laureate in the Lincoln Academy, Springfield, Illinois, May 20, 1972
MacMurray College's Chemistry Building named the Percy Lavon Julian Hall of Chemistry, May 13, 1972 (Jacksonville, Illinois)
Coppin State College's Percy L. Julian Science Classroom Building dedicated May 3, 1968 (Baltimore, Maryland)
Illinois State University, Normal, Illinois, Percy Julian Hall dedicated October 26, 1975

LEARNED SOCIETIES

Fellow, American Institute of Chemists
Fellow, Chemical Society of London
Fellow, New York Academy of Science
Member, American Chemical Society
Laureate, Lincoln Academy, Springfield, Illinois, May 20, 1972
Member, American Association for the Advancement of Science
Honorary Member, Illinois State Academy of Sciences, elected April 19, 1975
Member, National Academy of Sciences

EDUCATIONAL, RELIGIOUS, AND CIVIC ACTIVITIES

Member, Board of Trustees, DePauw University, Greencastle, Indiana
Member, Board of Trustees, Roosevelt University, Chicago, Illinois
Member, Board of Directors, Chicago Theological Seminary
Member, Board of Trustees, Southern Union College, Wadley, Alabama
Member, Board of Governors, International House, University of Chicago
Member, Phi Beta Kappa Associates
Member, Board of Directors, NAACP Legal Defense and Educational Fund
Vice President, Business Advisory Council of the Chicago Urban League
Chairman, Commonwealth Edison Environmental Advisory Council
Co-Chairman, National Negro Business and Professional Committee of the Legal Defense and Educational Fund
Emeritus Member, Executive Committee of the Board of Trustees, Howard University, Washington, D.C.
Emeritus Member, Board of Trustees, Fisk University, Nashville, Tennessee
Past Member, Board of Regents, State of Illinois Colleges and Universities
Extramural Counselor, National Institute of Arthritis and Metabolic Diseases, National Institutes of Health, Bethesda, Maryland
Past Member, Board of Directors, Fund for the Republic, Center for the Study of Democratic Institutions
Retired Member, Executive Board, Chicago Chapter, National Conference of Christians and Jews
Past President, Phi Beta Kappa Association of Greater Chicago
Past Director, Mental Health Association of Greater Chicago
Past Member, Illinois Advisory Committee, Commission on Civil Rights
Past Chairman of the Council for Social Action, Congregational Christian Churches of America (Now United Church of Christ)
Retired Deacon and Retired Trustee, First Congregational Church of Oak Park

Past Member, Board of Public Welfare Commissioners of the State of Illinois
Past Director, Provident Hospital, Chicago
Past Director, The Mandel Clinic, Chicago
Past Director, The Chicago Urban League
Past Secretary, Troop 8, Boy Scouts of America, Oak Park
Past Member, Midwest Regional Advisory Committee of the Institute of International Education
Century Member, Thatcher Woods Council, Boy Scouts of America

BIOGRAPHICAL SKETCHES

"The Man Who Wouldn't Give Up," *Reader's Digest*, August 1946
"In the Shake of a Hand," *Milwaukee Journal*, August 1947
"Slavery's Grandchildren," *Coronet*, January 1948
"The House that Joyce Built," *Fortune*, May 1949
"The Man Who Wouldn't Give Up," *Advance Magazine*, December 1952
"Julian Aids Mankind," *Chicago Tribune*, 6 January 1963
"Chemist with a Cause," *The Rotarian*, June 1963
"Eminent Scientist and Public Servant," *Advance Magazine*, January 1958
"Percy L. Julian's Fight for His Life," *Ebony Magazine*, March 1975

SCHOOLS NAMED FOR DR. JULIAN

P. L. Julian School, Phoenix, Arizona
Percy L. Julian School, Marrero, Louisiana
Percy Julian High School, 10330 South Elizabeth Street, Chicago, Illinois 60649

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1935

With J. Pikl. Studies in the indole series. III. On the synthesis of physostigmine. J. Am. Chem. Soc., 57:539-44.

With J. Pikl. Studies in the indole series. IV. The synthesis of d,1-eserethole. J. Am. Chem. Soc., 57:563-66.

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1960

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U.S. 2,940,991. With A. Magnani. Method for Epimerizing 11-Bromo-Steroids. Granted June 14. (C.A. 54: 19772 [1960]). Also Canadian 630,065.

French 1,254,408. With A. Magnani. Procedure for the Preparation of Steroidal Compounds Utilized for the Obtention of Corticoid Hormones. Granted June 14. (C.A. 54: 19772 [1960])

British 846,045. 11,12-Epoxy-Steroids. Granted August 24. (C.A. 55: 10508 [1961])

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1961

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British 873,633. Improvements in or Relating to Process and Intermediates for Preparing Steroid Compounds. Granted July 26. (C.A. 56: 4838 [1961])

Canadian 630,071. With A. Magnani. 11,12-Epoxy-Steroids and Method of Preparation. Granted October 31.

Canadian 614,085. Liquid Shortening.

U.S. 3,013,026. With A. Magnani and V. Georgian. Process for the Preparation of 3-Keto-Δ^{4}-20-Alkyl-Amino-Steroids. Granted December 12. (C.A. 56: 8810 [1962])

1962

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British 1,009,803. With A. Huang and A. Magnani. 5,6-Dichloro-16a-Methyl-pregnanolones. Granted April 17. (C.A. 57:11278 [1962])

U.S. 3,052,694. With A. Magnani. 12-Alkyl-12-Hydroxyprogesterone Derivatives. Granted September 4.

1963

Canadian 662,612. Substituted 2,5-Dien-4-one-Steroid Derivatives. Granted May 7. (C.A. 54: 1622 [1960])

U.S. 3,055,918. With J. W. Cole. The Reduction of an Epoxy Group such as Alpha to a Keto Group. Granted September 25.

1964

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Australian 229,846. Improvements in or Relating to 11,12-Epoxy-pregnane Derivatives and the Preparation Thereof. Granted October 20.

British 1,031,080. Improvements in or Relating to 16-Amino-methyl-17-alkyltestosterone and Isotestosterone Derivatives. (C.A. 62: 9205 [1965])

U.S. 3,153,061. With E. Huang and A. Magnani. 17-Substituted-2,5-pregnadiene Derivatives. Granted October 13.

U.S. 3,153,646. With A. Magnani. Process for the Production of 11β,12β-Epoxypregnan-3,20-dione. Granted October 20.

1965

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Netherlands 64/06303. 3-Keto-$\Delta^{4,5}$-Steroids.

Netherlands 64/06306. Corticosteroids.

1966

U.S. 3,231,568. With J. M. Hill. Processes and Intermediates for Preparing 16a-Methyl-Corticoids. Granted January 25. (C.A. 64: 9802 [1966])

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British 1,060,354. Process for Preparing 3-Keto-$\Delta^{4,5}$-Steroids. Also French 1,403,946; Mexican 83,686.

British 1,087,899. With J. M. Hill. Process for Preparing 16α-Methyl-3p,17α-Dihydroxy-Δ^{5}-pregnen-20-one. Granted January 25. (C.A. 64: 9802 [1966])

1970

German 2,018,730. Verfahren zur Einführung einer olefinischen Doppelbindung in ein Steroid durch Reduktion einer Oxidogrupp.

1973

U.S. 3,711,611. Composition of Matter with Low Cholesterol Content and Containing Wool Grease Alcohols as Major Component and Method. Granted January 18. Also Belgian 788,507; British 1,350,355.

U.S. 3,759,899. Process for Introducing a Delta 5,6-Double Bond into a Steroid. Granted September 18.

U.S. 3,761,469. Process for the Manufacture of Steroid Chlorohydrins. Granted September 25.

1974

U.S. 3,784,598. Process for Conversion of a 3-Hydroxy-5,6-Oxido Group of a Steroid into a Δ^{4}-3-Oxo-Group. Granted January 8.

U.S. 3,821,121. Preparation of Wool Wax Alcohol of Low Cholesterol Content Useful as Dispersing and Emulsifying Agent. Granted June 28.