AN ENGLISH UNIVERSITY PROFESSOR

Sir William A. Tilden's memoir1 of the life and work of the late Professor Sir William Ramsay will be read with interest by all members of this institution, and especially by those who were in residence at the time of Professor Ramsay's visit to the Rice Institute. Ramsay died in 1916, full of honors, but not in the fullness of his days, for he was born as lately as 1852. I made his acquaintance for the first time, and in his own laboratory, some half a dozen years ago when, at the request of the Rice Trustees, I went abroad in 1911 to invite a number of foreign scholars to assist us in dedicating the new university in the autumn of 1912. Sir William generously and promptly accepted our invitation both for himself and for Lady Ramsay.2 While in Houston the Ramsays were entertained in the hospitable home of Captain and Mrs. James A. Baker, and during their stay made a host of new friends and renewed acquaintance with many old ones among the visiting

2 To Lady Ramsay's account of their visit to the Rice Institute, Sir William Tilden appends the following note:

"The proceedings at the inauguration of the Rice Institute are recorded with full detail in The Book of the Opening of the Rice Institute, the title-page of which also adds the following words: 'being an account in three volumes of an academic festival held in celebration of the formal opening of the Rice Institute, a university of liberal and technical learning, founded in the city of Houston, Texas, by William Marsh Rice and dedicated by him to the advancement of letters, science and art.' These volumes contain the lectures given on the occasion by the eminent men who had been invited to assist by their presence and contributions. Volume three contains the lectures given by Ramsay, the titles of which are as follows: (1) The Electron as an Element, (2) Compounds of Electrons, (3) The Disruption of the so-called Elements. These lectures develop in greater detail the application of the ideas set forth in presidential addresses to the Chemical Society of London. They are purely speculative but they illustrate the readiness with which Ramsay could turn from conventional views of chemical action, and the boldness with which he could develop hypotheses to fit the facts. It is true, as he says at the end of lecture two, that 'the electron is no mythical conception, and that it enters into the constitution of matter is as certain as that matter exists.' It does not follow, however, that there is much positive foundation for hypotheses as to their motions and combinations, and further study of the facts and phenomena connected with chemical action is necessary before solid ground is reached. Until the world settles down again to the peaceful occupations of civilization there is not much prospect of advance in this direction."
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deleagtes to the first Rice Institute academic festival. Lady Ramsay was most charming, and our citizens found Sir William to be not only a great man but a good fellow. His inaugural lecture, as an exciting adventure for his auditors, was among the most brilliant performances of those memorable days. It has been published, along with the two others he presented on that occasion, in the Rice Institute Pamphlet, Vol. I, No. 4, and is still accessible to anyone who may desire a copy. No one of our guests entered more heartily into the spirit of the occasion than did Sir William, from the first day, when at the municipal luncheon he objected to Mayor Rice's introduction of him as a "foreign visitor," when later he led another assemblage in the singing of "Auld Lang Syne," on up to the very last formal meeting when he referred to himself as a "sage-femme" on conveying the congratulations of the University of London and other institutions whose greetings he had been commissioned to bring to the Rice Institute. He was enthusiastic about the city and the university; I have had repeated occasion to hear echoes of the vocal expression he gave to that enthusiasm in Baltimore, Washington, New York, Boston, and London. Moreover, his interest continued unabated in our work. He followed our undertakings from year to year with recommendations of men and measures forwarded in letters from time to time just as they occurred to him. His counsel came from large experience as an administrator, for he himself had been for years Principal of University College, Bristol, before assuming the professorship of chemistry in the University of London. From the latter professorship he had retired some time before his death. Among my cherished letters is one written, as he said, on the day when he was leaving his lecture desk for the last time. At the beginning of the Great War he was one of the very first to place his scientific abilities at the disposal of his government, and he has served that government constantly since, in an advisory capacity on various scientific committees. Moreover, some ten years before, in articles on patriotism in the universities, he had been preaching preparedness to his countrymen. "Recognizing that it is the duty of every able-bodied man to be prepared to defend his country," he says in one of these discussions, "let us ask how can university men contribute to this end? By becoming Volunteers, it may be answered. True; but could not some arrangement be made whereby service would be made compatible with academic work? . . . Could we not form the habit of devoting one of our university years to shooting and drill? Is it not fitting that the brains of the nation should set the example to the rest? Would it not be possible to create the feeling that not to have learned to defend one's country is 'bad form'? That to have
taken a degree without having done one's duty is unworthy of our man-
hood." Such were the considerations he also urged on us in 1912, not,
as he said, in any spirit of militarism, but in the firm conviction that
the way to avoid war is to be well prepared, and that it is the duty of
every young man of education to bear his share in insuring his country
against future misfortunes. I could more than completely fill the space
available in a mere recital of the honors and distinctions which represent
the recognition of Professor Sir William Ramsay's services to science
and society. I should have great hesitation in attempting anything like
an adequate estimate of those services, but in concluding this personal
reminiscence and appreciation of his visit to Houston I venture to quote
from some words of introduction which I had the honor to use at that
time: "Professor Sir William Ramsay, K.C.B., of London, England:
late Professor of Chemistry at University College, London; Nobel Lau-
reate in Chemistry, 1904; President of the Seventh International Con-
gress of Applied Chemistry; a facile experimenter of boldness and in-
genuity, who has devised new theories and revived outworn ones in a
series of remarkable achievements which of themselves constitute an
epoch in the history of the chemical elements and a permanent chapter in
the annals of science."¹

For several outstanding biographical details, and, more particularly,
for Ramsay's views on university education, let us turn from personal
reminiscence to Sir William Tilden's admirable memoir. And an ad-
mirable biography the volume is: admirable in sense and scope and spirit:
readable as Mrs. Humphry Ward's "Recollections," and above the re-
proach of Mr. Lytton Strachey's recent criticism of some forms of Eng-
lish biography: "Those two fat volumes, with which it is our custom to
commemorate the dead—who does not know them, with their ill-digested
masses of material, their slipshod style, their tone of tedious panegyric,
their lamentable lack of selection, of detachment, of design? They are
as familiar as the cortège of the undertaker and wear the same air of
slow, funereal barbarism. One is tempted to suppose of some of them,
that they were composed by that functionary, as the final item of his job."

¹Ramsay held membership in practically all of the scientific societies of
the learned world; had been awarded medals and prizes by a number of
such societies in America, England, France, Germany, Italy, and Sweden;
had been decorated by the heads of the English, French, German and Italian
governments; and had received honorary degrees in philosophy, science,
laws or medicine from Dublin, Glasgow, Cracow, Heidelberg, Columbia,
Cambridge, Oxford, Liverpool, Jena, Birmingham, Sheffield, Bristol, Chris-
tiania, Johns Hopkins, and Durham universities, the institutions being ar-
ranged here according to the chronological order in which the several
degrees were conferred.
As Gilbert Burnet said of his mother, Ramsay's parents—William Ramsay and Catharine Robertson, married at forty—were "good, religious people, but most violently engaged in the Presbyterian way." Their only child, pointing out in an autobiographical sketch that his forefathers on the paternal side were dyers for certainly seven generations while on his mother's side they were physicians, says "it may be safely concluded that I had the prospect of possessing chemical instincts by way of inheritance." These instincts, however, did not assert themselves very early. It seems that chemistry was not among his studies while an undergraduate at the University of Glasgow, which at fourteen years of age he entered to remain three years, though before he left school for the University he had, during convalescence from a broken leg got at football, read Graham's Chemistry, but "with the object chiefly, as he confesses, of finding out how to make fireworks." His studies in college were perhaps determined somewhat by his mother's desire that he should prepare for the ministry. He of course attended the Latin and Greek classes, although he had small liking for either Latin or Greek. He became, however, a most accomplished linguist and later in life welcomed the delegates to an international congress by himself delivering addresses of greeting in English, French, German, and Italian. It was only in October, 1869, that he began to study chemistry systematically, and then on entering Mr. R. R. Tatlock's laboratory in Glasgow; in 1870 we find him in Bunsen's laboratory in Heidelberg; by Easter of '71 he is proceeding to Tübingen, where the following year at the early age of twenty he received his doctor's degree. Among his fellow students at Tübingen was the American chemist, Ira Remsen, who lately retired from the presidency of the Johns Hopkins University. In a recent letter to Lady Ramsay, from which Sir William A. Tilden quotes, President Remsen says: "In looking over recently some letters from my old friend, Ramsay, I came upon one dated March 23rd, 1904, that began with these words: 'Who would have thought when you opened the big, front door of the Tübingen laboratory in 1871 and in answer to my question in questionable German, "Können Sie sagen wo ist die Vorlesungszimmer?" you replied after a pause, "Oh, I guess you want the lecture-room," that I should now write after thirty-three years to tell you ——.' This is one of his favorite stories." Recalling the relations of a group of Englishmen, Scotsmen, and Americans then studying chemistry in Tübingen, Dr. Remsen goes on to say that Ramsay "was the youngest of our little party and was a great favorite. One of our forms of recreation was baseball. . . . When in 1912 the Johns Hopkins University conferred the honorary degree of Doctor of Laws upon Sir William it fell to my lot as President of the University to make a few remarks and he replied,
neither of us could refrain from referring to our Tübingen days, and the baseball club was recalled in public by Sir William. Among other things he said: ‘I tell you the Tübingen baseball club was not to be sneezed at.’ In this connection it is interesting to recall that the present Lord Milner was at times a member of the club.” After referring to Ramsay’s skill in skating and singing, and commenting on his companionableness in social life, President Remsen concludes his student recollections with: “I cannot refrain from quoting the last words of the last letter he ever wrote me, dated March 15, 1916, ‘Well, I am tired and must stop. I look back on my long friendship with you as a very happy episode in a very happy life; for my life has been a very happy one.’”

Ramsay’s doctor’s dissertation was entitled “Investigations on the Toluic and Nitrotoluic Acids.” In August of 1872 he returned from Germany to Glasgow to become assistant in the Young Laboratory of Technical Chemistry. Two years later he was appointed tutorial assistant in Glasgow University under Professor John Ferguson, and published his first independent paper, “On Hydrogen Persulphide.” In 1880 he became professor of chemistry at University College, Bristol. In 1881 he was elected Principal of the College, and in August of that year was married to Margaret, daughter of George Stevenson Buchanan. In 1883 he published the first paper of a series of papers jointly with Dr. Sydney Young, a series extending through some thirty-five papers and up to the year 1895. During the Bristol period Ramsay was instrumental in initiating a campaign which finally secured government grants to the University Colleges of England. In 1887 he was elected to the professorship of chemistry at University College, London, and held the chair for twenty-five years. Here were to be made his great discoveries in the chemistry of the gases of the atmosphere: in 1894 the isolation and study of argon in association with Lord Rayleigh; in 1895 the discovery of terrestrial helium; in 1898 the discovery of neon, krypton and xenon; in 1903 the recognition of helium as a product of the disintegration of radium emanation; in 1905 the discovery of radio-thorium; in 1910 the determination of the density of niton (radium emanation). From his chair in chemistry at University College he retired in 1912. His last communication to the scientific world is dated April 1st, 1916, and is entitled “A Hypothesis of Molecular Configuration in Three Dimensions of Space.” Sir William Tilden remarks, however, that this paper is the result of experiments made some years previously. The paper is printed in the Proceedings of the Royal Society, issued July 1st, 1916. Ramsay passed away quietly in the early morning of July 23rd, 1916.

So in rough outline runs Ramsay’s record of achievement. It is a record of research, invention and discovery. And as such it represents
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also for him the beginning, middle and end of university education. For him the supreme question in education is: "How can knowledge best be increased?"

"Recent correspondence and articles which have appeared in the public Press," he writes in the course of two articles on "Universities Abroad," contributed to The Times (London) in June, 1892, "show that there are in England many conceptions of what a University should be. Many of the writers appear to consider a college as necessarily a hall of residence, as in Oxford or Cambridge; many suppose the primary function of a University to consist in bestowing degrees after a certain course of study; while others advocate the claims of a 'University for the People,' where weekly evening lectures should lead to recognition of the students as eligible for an associateship or for a degree. There are yet others who imply that the function of a University consists in examination only, and who uphold the University of London as an ideal institution. In this state of opinion it is well to cast our eyes abroad, and to enquire what conception of a University is held by the nations of the Continent. Before beginning an experiment it is advisable to study the literature of the subject, for thus only can errors be avoided and a reasonable prospect of a successful issue secured. This is the invariable prelude in these days to all scientific inquiry, and surely the most important of all is: How can knowledge best be increased?"

"This," says Sir William Tilden, "was the question ever before the mind of Ramsay, and in his ardour for research into the unknown he seems to have attached less importance to those other functions of universities which are connected with preparation for professions and for the every-day life of the world. Probably his view would have been that initiation into the methods of scientific research is the best preparation for successful investigation of the problems which come before the physician, the engineer, the agriculturist, the teacher, the man of business no less than the man who takes up natural science as a pursuit to be followed through a lifetime. And his distrust of examinations and their results as a means of discovering capacity or rewarding merit often brought him into conflict with those who rely more confidently on the utility of examinations as an educational instrument. This is a large question of far-reaching importance upon which unanimity can never be expected." And Tilden goes on to say by way of further comment that "men of genius like Ramsay are apt to forget, if they become teachers, that the average quality of mind among students is very different from their own, and

1 Ramsay's views on the subject of elementary and secondary school education may be gathered from an article published in January, 1916, the last year of his life, by the Manchester Daily Dispatch. Tilden quotes at length from this article, pp. 195-199.
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attempts to apply indiscriminately methods which appeal to their own mental activity and resource are certain to meet with disappointment in the great majority of cases. It is, in fact, too often forgotten not only by teachers but by parents and others that though a natural faculty may be improved by education, it can never be created by any process in those cases where the natural faculty does not already exist. Poets, mathematicians, researchers are born, not made, and all that education can do in any case is to educe, train and strengthen qualities already existent which might otherwise run to waste and produce merely mischief."

His views on the subject of university education Ramsay had an opportunity of setting forth at length in an oration delivered at the University College, London, June 6th, 1901, entitled "The Functions of a University." This was printed in the volume of Essays, Biographical and Chemical, bearing the imprint of Dutton, New York, 1909. The volume was later translated into German under the title Vergangenes und Künftiges aus der Chemie. The second edition of the German version, published in 1913, contains the autobiographical sketch to which reference was made in an earlier paragraph of this review. The last essay in the volume of Essays consists of the oration to which reference has just been made. In some half dozen pages of extracts Tilden has threaded together in interesting fashion Ramsay's arguments and illustrations, but substance and spirit suffer inevitably by the cutting, and accordingly permission of the publishers has been obtained for reprinting the original essay in full as an article in this number of the Rice Institute Pamphlet.

Early in this article I made reference to some of Ramsay's views on patriotism; as already indicated, I shall later be quoting at length from his views on education. He was loyal to country; he was loyal to kin and kind. On every one of his countrymen he placed obligation to serve the country; for every one of his countrymen he urged opportunity for the development of any originality within him. Patriotism, education, and religion; how stands Ramsay's record in account with religion? It is an intimate, personal question to ask. To its answer Sir William Tilden gives some clues. In the course of the years there were undoubtedly crumblings from the creed of the Covenanters, but if perennial cheerfulness and charity—not merely charitableness but concrete charity—distinguish the Christian character, his Christian experience in an evangelical sense was far from incomplete. Tilden suggests that the position reached by Ramsay seems revealed in the following extract from a letter which, at least in substance, Ramsay wrote to more than one of his correspondents:

"This is Sunday and I am going to continue our conversation of three weeks ago, and give you two quotations, one neutralising the other, I
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think. The first is from W. H. Howells,¹ and is called 'The Bewildered Guest':

'I was not asked if I should like to come.
I have not seen my host since here I came,
Or had a word of welcome in his name.
Some say that we shall never see him; some
That we shall see him elsewhere, and then know
Why we were bid. How long I am to stay
I have not the least notion. None, they say,
Was ever told when he should come or go.
But every now and then there bursts upon
The song and mirth a lamentable noise,
A sound of shrieks and sobs, that strikes our joys
Dumb in our breasts; and then, some one is gone.
They say we meet him, none knows where or when;
We know we shall not meet him here again.'

The second is in Paul Kelver, by Jerome K. Jerome, a book which I strongly recommend, if you haven't read it already:

'What do you believe,' I asked, 'father—really, I mean?' The night had fallen. My father put his arm around me and drew me to him, 'That we are God's children, little brother,' he answered, 'that what He wills for us is best. It may be life, it may be sleep; it will be best. I cannot think that He will let us die; that were to think of Him as without purpose. But His uses may not be our desires. We must trust Him. 'Though He slay me, yet will I trust in Him.'"

We walked awhile in silence before my father spoke again. "Now abideth these three: faith, hope and charity—you remember the verse—faith in God's goodness to us, hope that our dreams may be fulfilled. But these concern but ourselves—the greatest of all is charity." "Be kind, that is all it means," continued my father. "Often we do what we think right and evil comes of it, and out of evil comes good. We cannot understand—maybe the old laws we have misread. But the new law that we love one another—all creatures He has made—that is so clear. And if it be that we are here together only for a little while, the future dark, how much the greater need have we of one another!"

"I think there is little more to be said. Indeed, it is all the Law and all the Prophets," concluded Ramsay. "How such a view harmonised with Ramsay's own nature," continues Sir William Tilden, "is illustrated in many an act of charity and benevolence. He never shut his ears to any tale deserving of pity. But many people who have similar charitable impulses draw the line at misfortunes which people bring on themselves. It was not so with Ramsay. An

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employe of a society with which he was connected was discovered to have falsified the books and to have misappropriated moneys entrusted to him. After his defalcations were discovered Ramsay, fearing he might contemplate suicide, went to see him at his house, urged him to make a clean breast of it, and afterwards did everything in his power to win him back to ways of honesty and give him a fresh start in life. Two other cases of a similar kind may be mentioned. One was that of a friend who met with misfortune in business, took to drink, and gradually sank in the social scale. He emigrated subsequently to America. Many people would have been glad to be quit of a friend who might have become very troublesome. That was not Ramsay’s way. When he visited America he sought him out and did what was possible to relieve him. The other was a case of matrimonial trouble. The husband was the flagrant offender. He occupied a good position originally, which he forfeited in consequence of the irregular habits into which he fell. Ramsay spared neither time nor trouble in his efforts to reclaim him, and that at a time when he was immersed in his researches and in university business.” “Other cases,” continues Sir William Tilden, “are known to his friends, but for obvious reasons details cannot be given in these pages. But to omit notice of these facts would be to do less than justice to this fine feature of Ramsay’s character.”

And in still another paragraph Sir William Tilden throws that same character in similar relief from a slightly different angle:

“Notwithstanding the extraordinary fame of his long series of brilliant discoveries, Ramsay never showed that the height to which he had risen in the eyes of the world lifted him beyond the range of old friendships. Although he left Glasgow in 1880, he kept in close touch all through life with many of the friends of his youth there and was never happier than when in their company, recalling memories of the trials, humours and triumphs of the old days when he was assistant to Professor Ferguson. To his students he was the same sympathetic and kindly teacher at the end as at the beginning of his career, while to his contemporaries he was always friendly and courteous. His spirit and his enthusiasm for scientific research have left their deep impress on students young and old, and through them will pass on to future generations.”

This last paragraph brings author, reader and writer literally to the last paragraph of the memoir. To write a review of a biographical memoir is hardly less difficult than the writing of the memoir; and some one has remarked lately that to write a good life is just about as hard as to live one. But, however inadequately the present review may have reflected a very few of the many fine passages in Sir William Tilden’s admirable memoir of Sir William Ramsay, it could conclude on no better
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note than the final appraisement of Ramsay's place in science—chemist's appraisement of chemist:

"We look back over the centuries," says Tilden, "and among the founders and master builders of their science we see the outstanding figures of Boyle and Black, Lavoisier, Priestley and Scheele, Cavendish, Davy, and Berzelius, with a few more. The stream of time bears along to oblivion the vast majority of the sons of men, and though in this age of scientific activity there is an ever-increasing army of workers, most of them are engaged in supplying merely the bricks of which the edifice of scientific knowledge is built. They have their reward in their own day and generation. The name of William Ramsay will always stand among those of the Master Builders.

"He hath shewed thee, O man, what is good; and what doth the Lord require of thee, but to do justly, and to love mercy, and to walk humbly with thy God?—Micah vi:8.""