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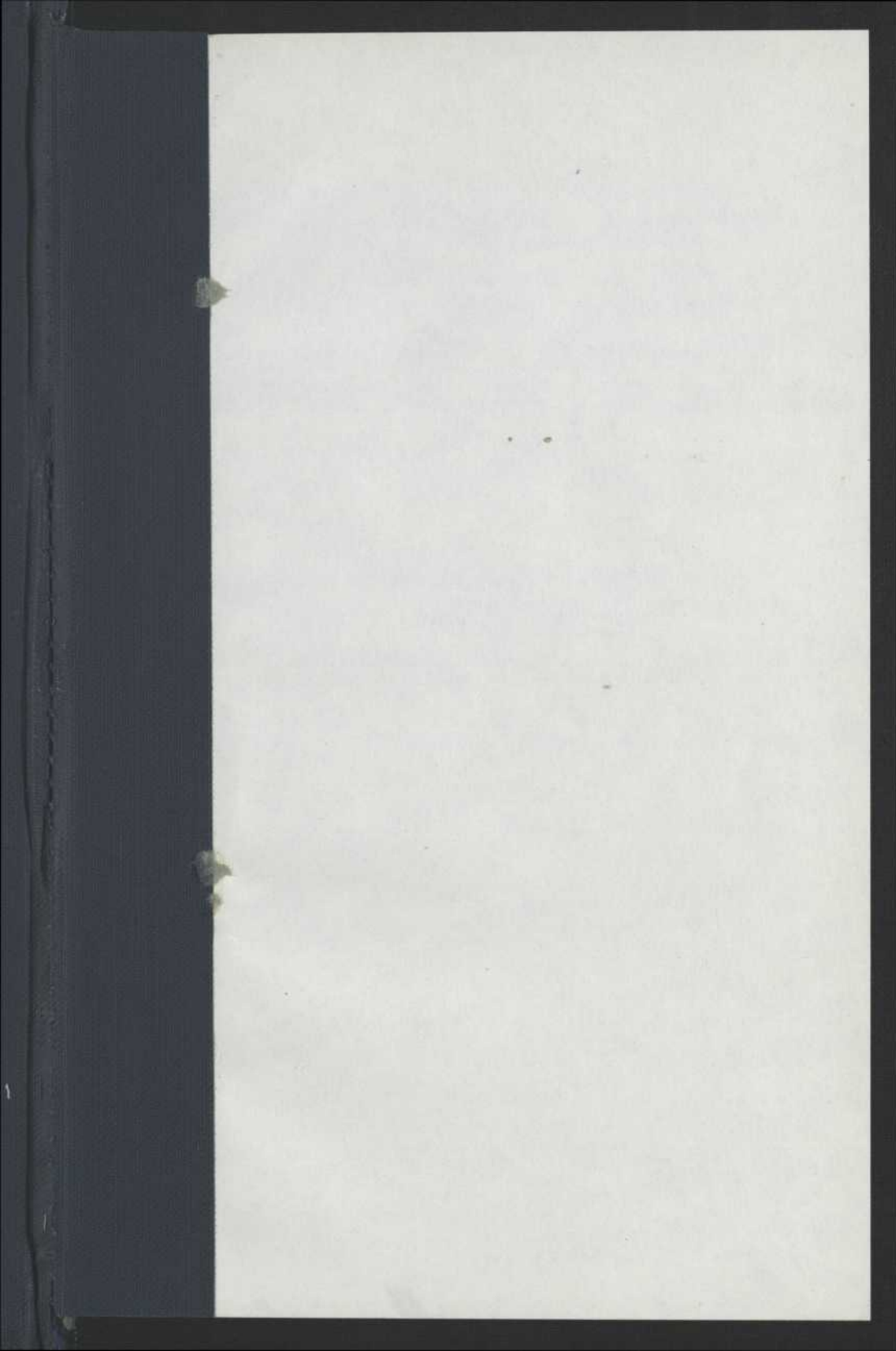
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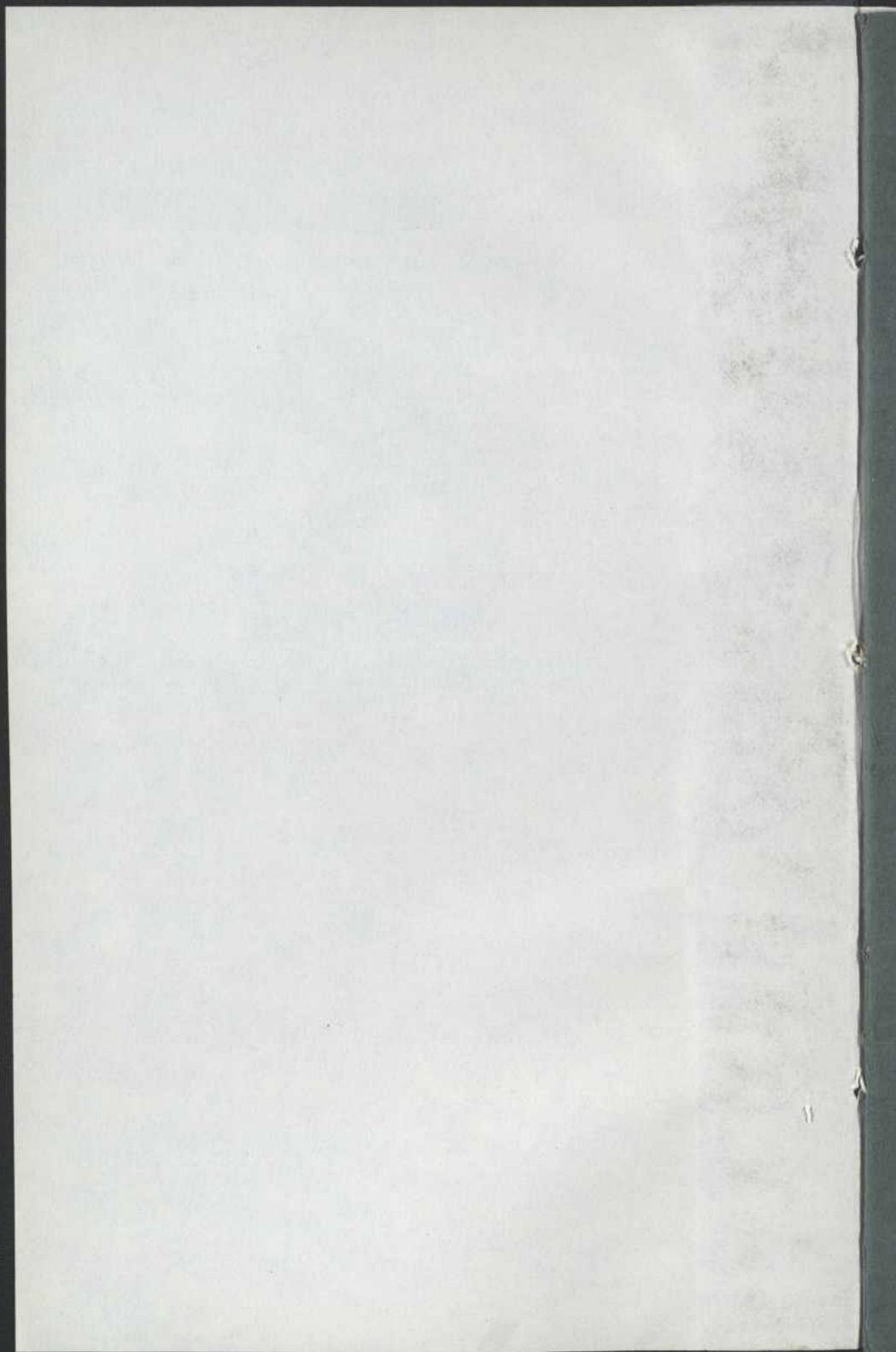
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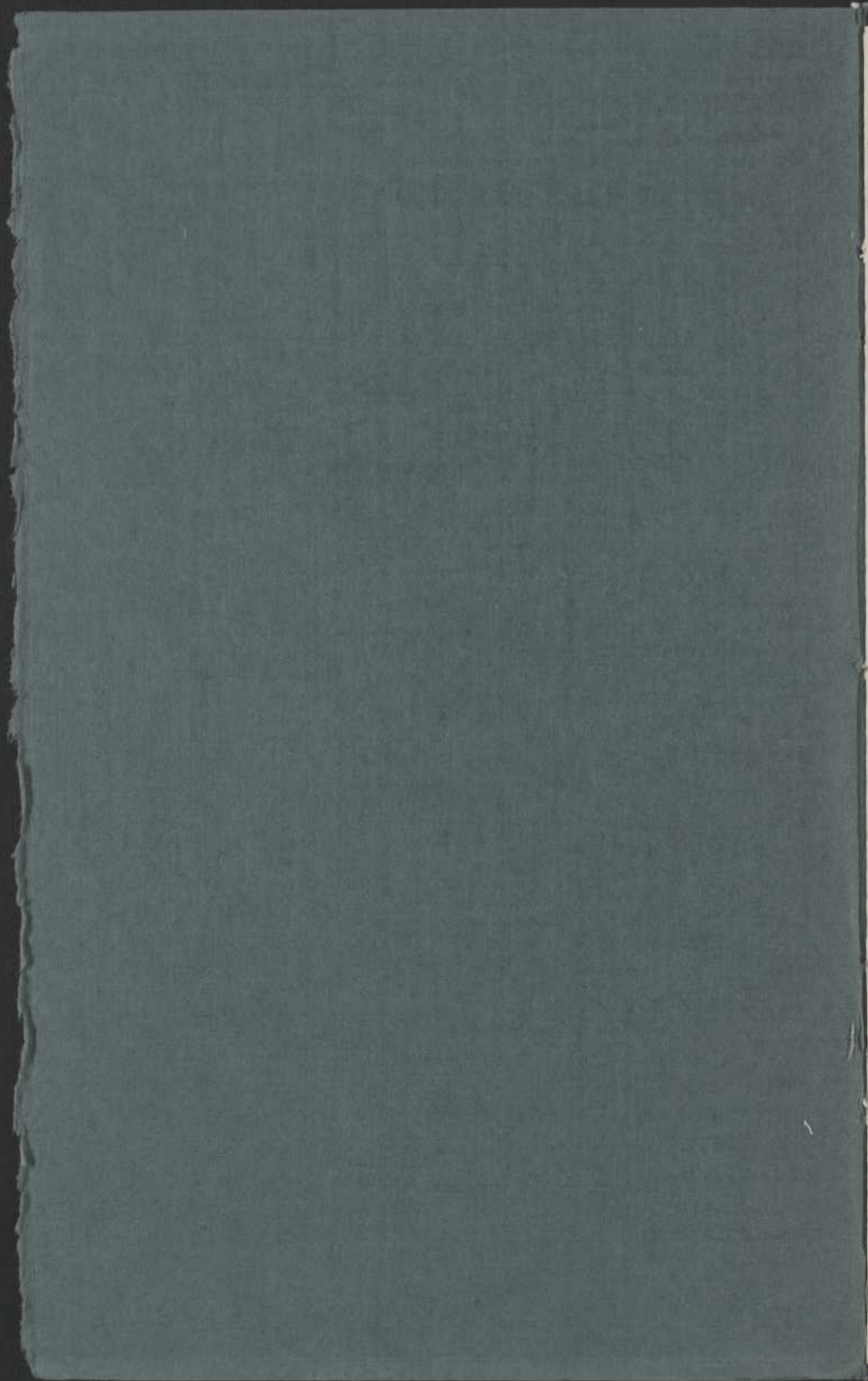




I N M E M O R I A M

ETIENNE SAMUEL BIELER

1895 - 1929



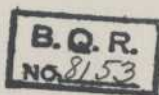
ETIENNE SAMUEL BIELER

by

DR. A. S. EVE

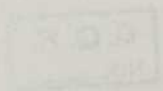
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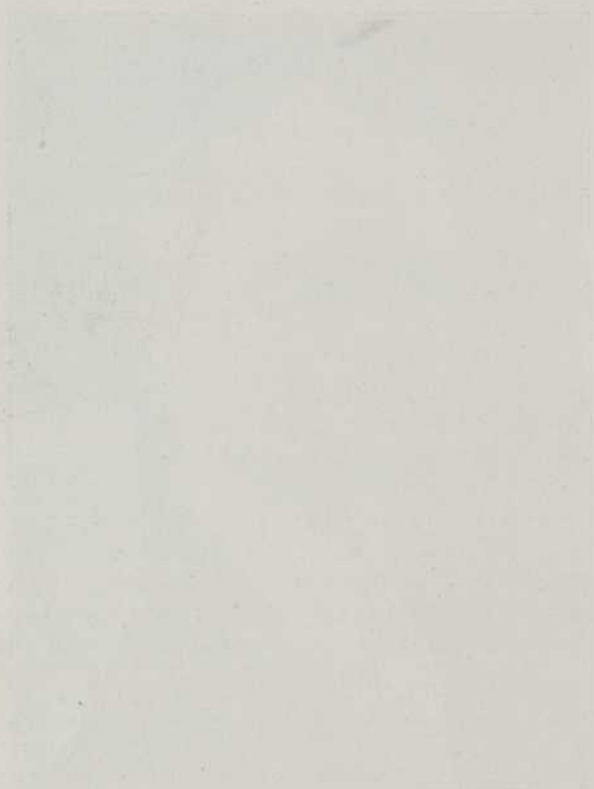
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DR. ETIENNE S. BIELER

1895 - 1929



Etienne Samuel Bieler

By DR. A. S. EVE

WHEN on the 25th of July of this year news was received of the death of Dr. E. S. Bieler, while on a scientific mission in Australia, none of his friends were more grieved and shocked than his comrades at McGill, for the young professor was, as Sir Arthur Currie has observed, "a successful teacher, a chivalrous colleague, and a loyal alumnus of the University."

Etienne Samuel Bieler was born on February 3rd, 1895, at Lausanne, Switzerland, and when his parents went to Paris he entered the Lycée Carnot. Later, at the age of thirteen, when the family moved to Montreal, he found himself, knowing but few words of English, in the Montreal High School. He rapidly rose; and took first place in his class in seven months. In 1911, he led the Province of Quebec in the matriculation examination with the remarkable average of ninety-four per cent.

He entered McGill University with a Macdonald Scholarship and quickly showed his natural taste and ability, which culminated in the Anne Molson Medal and a First Class in Honour Mathematics and Physics.

Before the Convocation of May, 1915, he joined the First University Company as a private and, leaving Canada on May 28th, went into training at Folkestone and Shorncliffe, after which the Company was incorporated into the Princess Patricia's Canadian Light Infantry, and went to the front trenches at Armentières.

After a few months' fighting, the young private was sent to England to train as a lieutenant in the Field

Artillery, and subsequently began his new duties with an ammunition column in Belgium. He was in charge of trench mortars in the Ypres Salient when wounded in the head on August 3rd, 1916. After recovery, he took part in the Battle of Courcellette, and was severely wounded in the leg on April 28th, 1917. An amputation was narrowly averted, and after long hospital treatment he was given leave of absence to Canada. One of his superior officers wrote about his military career, "A brilliant student and thinker, the whole army life and the war in general must have been abhorrent to him, but he took his share of its responsibilities with the same earnestness and application which always characterized his work."

He spent two happy months in Canada, but the war restlessness revived in him and he accepted with enthusiasm Principal Peterson's offer to secure for him an appointment in the Anti-submarine Division of the British Admiralty. He arrived at Harwich when the German submarines were an appalling menace; wrecks around the shore, food running short, army communications and supplies threatened! The writer recollects introducing Bieler to Sir William Bragg with the words: "Pure gold," his judgment then and now! He was quickly utilized—at Scapa and on the coast of France—in schemes which, thanks mainly to the skill and gallantry of the Royal Navy and the Mercantile Marine, helped to mitigate the dire submarine attacks.

The war over, he returned to McGill University in February 1919, and continued his studies under the able and inspiring guidance of Dr. L. V. King, when the foundations were laid of his sound knowledge of advanced mechanics and electricity.

In May, 1920, he took his M.Sc. degree, won an "1851 Exhibition" Scholarship, with which he entered Caius College, and became a Research Student at the Cavendish

Laboratory, Cambridge, then and now under the direction of Sir Ernest Rutherford. It was a time when the inner citadel of the atom was assaulted by bombardment with the alpha particles of radium, and Rutherford had shown that the mass or weight of an atom is concentrated in a relatively small nucleus. Bieler joined enthusiastically in these investigations, and took his Ph.D. in June, 1923, with a thesis on "The Law of Force in the Immediate Neighbourhood of the Atomic Nuclei."

In Switzerland he had, during the summer of 1926, an amusing experience. Hearing that the Annual Conference of the Swiss Natural History Society was being held in the University of Fribourg, he took the train and, arriving late and unannounced, slipped quietly into the auditorium where the physical section had its meetings. As he entered, a German professor was explaining what he called the "Bieler Law." The young scientist from Canada, not realizing that such a thing existed, was beginning to wonder what was meant, when it dawned on him that, as the subject was the law of force near the nucleus of an atom, his own discoveries were being discussed. By that time the president, a professor in Zurich, had recognized Bieler on the last seat near the door, and at the close of the paper called upon him to answer questions, to the surprise and pleasure of the audience.

On his return from Cambridge, Dr. Bieler was appointed an Assistant Professor of Physics at McGill University, and in recent years he added to his intense interest in atomic physics a keen regard for applied geophysics in the search for ore. With Mr. H. G. I. Watson, he evolved a scheme for exploration within a large insulated loop laid on the ground through which passed an alternating current of a few amperes. By induction, the conducting ore-bodies out of sight beneath the earth respond with a secondary current, and the joint electromagnetic fields can be explored by suitable receiving

coils and headphones. Together they measured the ratio of the axes major and minor of the ellipse of polarization. This work took him to some of the famous mines in the Rouyn district in northern Quebec. The outdoor life, the interest of a new problem, and his association with mining men and geophysical prospectors brought a new zest to life, and produced a conflict between his love of pure physics and the attraction of a lively practical problem.

His success in this field led to his being invited to undertake geophysical work in Australia; and he received from McGill University two years' leave of absence to become Deputy Director of an expedition under the joint auspices of the British Empire Marketing Board and the Government of the Commonwealth of Australia. The object of this expedition was to search deeper for ore in Australia, as the famous mines near the surface were diminishing in production, and as new scope for Australian, and possibly for British, miners was most desirable. Had he lived for a few more months, he would have brought back to Canada a remarkable experience in magnetic, electric, seismic, and gravitational methods of exploration, which would have stood this Dominion in good stead.

His was a full life! Soldier, thinker, research student, explorer, a man thoroughly trained, with wide experience of theory and practice. It takes many years to find a man with such natural gifts, and many years again to train him to fruition. There must be enthusiasm as well as power!

Dr. Bieler was a lover of out-of-doors, whether in Canada, England, Scotland, Brittany, Switzerland, Italy, the Netherlands, or Germany, he developed a keen appreciation of nature, of art, and especially of mediæval architecture, in which he became an enthusiastic connoisseur. Many countries were precious to him, but

always he had a special affection for his native land in all seasons and in all weathers—Switzerland!

An account of his life would be incomplete without mention of his qualities as friend and colleague, as son and brother. These qualities of character surpass those of genius. Fortunate indeed are those who combine both! Like Faraday, Maxwell, Kelvin, Stokes, and Rayleigh, he was a man of great faith, without too close a definition of dogma. He identified himself with his church, and was ready to work for it and to help its members. I know full well he was a good colleague and comrade, and as son and brother he reached a summit transcending even the rest of his life's work. His father writes these words, "In our family circle we were constantly uplifted by his radiant personality. We miss his sound advice and his deft hand, his humour, and his affection." In one of his last letters to his mother from Australia he wrote, "You are right, I am not in a religious atmosphere on this continent, but that fact allows me perhaps to think out those problems more independently. As I study the modern-scientific view-point, with its insistence on the organic unity of creation, and on the gradual evolution of inanimate nature towards life, as one of the natural consequences of the laws of matter and energy, some of the old beliefs fail to satisfy me, and I tend towards a conception of God, perhaps less personal, but not less real and not less sublime. And still, when I think of the personalities whose lives and actions are inspired by biblical ideas, when I think of the legacy which they have left behind, heritage of noble example and sturdy moral tradition, I realize that conceptions can never replace convictions, and I ask myself how this treasure can be preserved for our descendants. I see two sides to the revelation of God in the world, one in nature the other in personalities; it seems to me that it should be possible to find a synthesis."

All his letters from Australia and Tasmania, describing the country and its problems, the personnel of his party, the progress of their varied activities, their difficulties, successes, uncertainties, and expectations, were full of enthusiasm and whole-hearted interest in his work.

The news of his sudden death from pneumonia on July 25th, 1929, after thirty-two hours' illness, at Geraldton, Western Australia, came as a terrible blow to all who knew him.

The little town was moved by the sudden death of that young scientist, who had come all the way from Canada to help Australia. The authorities therefore decided that the pall-bearers should be delegates from the Magistrates and the Church. The members of the advance research party in the neighbouring camp of Northampton represented the Australian Geophysical Survey. Thus Etienne Bieler was laid to rest in the little Presbyterian cemetery on that far off coast of the Indian Ocean.

Etienne Bieler's tombstone will bear the inscription: "Blessed are the pure in heart for they shall see God."

To the nobility of his character, the high respect, admiration, and affection in which he was held, many letters and resolutions bear witness. Among the former may be mentioned those received from Dr. A. C. D. Rivett, Chairman of the Geophysical Executive, East Melbourne, Australia; F. W. Field, His Majesty's Senior Trade Commissioner in Canada; Professor A. D. Ross, University of West Australia; Professor J. P. Madsen, University of Sydney; Dr. A. O. Rankine, Imperial College of Science, London; Professor Maurice Belz, University of Melbourne; Mr. U. R. Evans, Cambridge; Mr. E. H. Guilford, Montreal; and among the latter those passed by the Australian Physicists, Melbourne, Australia; the Faculty of Applied Science, the

Physical Society of McGill University and the Royal Astronomical Society of Canada. Of these testimonies only a few short extracts can find place here.

Dr. L. V. King, F.R.S., Macdonald Professor of Physics, McGill University:

... "Before me are ten original papers on scientific subjects, published in British, Canadian, and American journals—a noteworthy contribution from the pen of a deeply mourned friend and colleague, cut off in the prime of his scientific activity and production. There is no doubt but that, had Bieler lived, he would have been among the foremost world authorities in the field of geophysical surveying"...

Sir Ernest Rutherford, P.R.S., Cavendish Professor, Cambridge:

... "He was a man of exceptional powers, with good theoretical insight. He was a fine fellow all round, and he is a great loss to your staff. . . His work under me was of fundamental importance, and gave us the first evidence of the laws of force round the nucleus. . . His premature death is a great blow to science, for he had shown unusual aptitude for investigation, and had read widely, and was much interested too in the theoretical aspects of many branches of his subject" . . .

Dr. J. Chadwick, The Cavendish Laboratory, Cambridge:

... "Bieler was a delightful companion both in and out of the laboratory. His frank enthusiasm for his own work, and his generous appreciation of the work of others were equally remarkable. It is perhaps unnecessary to point out the importance of Bieler's contribution to our knowledge of the atomic nucleus. . . He also took an eager interest in the doings of all around him,

and his freshness and enthusiasm were remarkable. . . I think that the chief conclusions reached by Bieler in his work may be put thus: That the collisions of alpha particles with light atoms disclose the complex structure of the nuclei and that the effective 'sizes' of the nuclei may be determined in this way, and that at very small distances the force between two charged particles is no longer given by Coulomb's law, but a new force, varying very rapidly with the distance, comes into action". . .

Mr. Broughton Edge, Director of the Australian Geophysical Survey:

. . . "Bieler joined us in July of last year, and within a few days we all realized what a source of strength had been added to our Survey. His ability and energy won the admiration of everyone with whom he came in contact, and our admiration soon became coupled with real affection—for it is seldom that one meets a man of such sincerity of purpose and with so charming a manner. As Deputy Director of our Survey, Bieler was concerned with all aspects of the work, and during the past six months, whilst I have been away, he took over my duties and displayed the most admirable judgment and resource in dealing with the numerous difficulties, which arose from time to time and are inevitable in a new undertaking of this kind. During this period he was largely occupied in administrative work, and in travelling the great distances which separate our field parties, but, in spite of this, he managed to continue with the electrical investigations which he commenced last year. We had learned to rely on him in many ways, but particularly so where theoretical considerations were concerned. Now that his guiding hand is withdrawn, I fear that our work will suffer severely. However, the effects of his death extend beyond the particular interests of our Australian survey, for his loss to science in general is a more serious matter by far". . .

Rev. Professor A. R. Gordon, D.Litt., in a resolution from the United Theological College, Montreal:

... "But what we chiefly valued was his singularly attractive personality. He was a choice spirit, devoted to the quest of truth, with a singleness and purity of soul that stamped him as one of God's gentlemen. Above all, he was a man of simple, honest faith and piety, who revered truth as the revelation of God's mind, and who took a direct and active interest in the advancement of His cause on earth." . . .

Dr. C. T. Lane, Fellow of the National Research Council:

... "As a post-graduate student in Physics, I was assigned to Dr. Bieler for training in research work, and I am glad for the opportunity to say what he was as a professor.

"In the class-room his teaching was lucid and full of a catching enthusiasm for physical science. In the laboratory he was both patient and exacting. In the choice of problems for his men he showed keen insight, and did not spare his own pains. His public lectures were so popular that the worry was to find seats enough for the audience. And sometimes, on a Saturday afternoon, he and one of his students would walk out together.

"For perhaps half the way we would discuss physics—the new and the old—the great classical structure of Kelvin and Maxwell and the new physics of Heisenberg and de Broglie. Then about other things, books perhaps, or sport, for which he had a great liking.

"Dr. Bieler's life was short, measured by the yardstick of years; but measured by achievement in his chosen work it was a full one. We may say with Professor Edmund Stoner that he possessed that untiring skill the sum of

whose patient labour has given to men's visions significance and reality."

On the 27th of October, 1929, an impressive Memorial Service was held in Moyses Hall, McGill University. Arranged by Professor R. E. Welsh and conducted by Professor A. R. Gordon, of the United Theological College, this service was attended by a representative gathering of professors, students and friends assembled that Sunday afternoon to pay homage to a man whose life was fully and nobly lived.

The following are brief extracts from the four addresses delivered:

Pastor Georges Peck, Montreal, speaking in French:

... "The traits of Etienne Bieler's character which I have cited, the purity of his life and his honest and persevering search after truth, would not make a complete picture if I did not speak of his earnest and unselfish attitude in connection with his church. His regular presence, the heartiness of his responses and of his singing, the devotion of his services as a member of our Board, the generosity of his gifts to our cause, were a constant encouragement to us. So long as, at Bethany, there shall remain one member who knew him, that person will remember his influence and example". . .

General Sir Arthur Currie, Principal of McGill University:

... "Although cut down in its prime, I, for one, believe that his life had come full circle whatever the tale of his years, and that somewhere in the Divine scheme of things there is compensation for the achievements that undoubtedly would have been his, and for the experiences he would have turned to good account.

"I was drawn to him first when I recognized in him a comrade in the great adventure. When I came to know more about him, to learn of his gentleness, his kindly nature, his love of the good and the beautiful, his attachment to his home and his family, I realized that he, for one, had not been dazzled, even momentarily, by what some may call the glamour of war, that it was only his strong sense of duty, his just appreciation of the issues involved, for he had a mind above his fellows and could detect those issues clearly, his hatred of shams and hypocrisies, his sense of what was at stake that led him to enlist when freedom's trumpet called her sons to battle" . . .

Address: Dean Ira A. Mackay, Faculty of Arts,
McGill University:

. . . "The mortal life of Etienne Bieler was itself visible proof of a life to come. His life was clean, beautiful, and unwordly. One need only to have met him to realize that no bitterness, nor hate, nor selfishness, nor meanness of any kind were in his life. Where then can death come in? If the soul be not diseased, how can it die? Noble minds in all ages have believed in a life to come; they would not have been noble minds if they had not" . . .

Address: Dr. A. S. Eve, F.R.S., Director, Department of Physics, McGill University:

. . . "I will not now speak of his eminent contributions to knowledge, but I would point out a remarkable coincidence, namely, that Dr. Bieler's work especially led him to investigations of what may fairly be termed the Unseen. In England this search was, by a scientific method, for that grave hidden menace the submarine, particularly its location in the waters which led to har-

hours, where the fleets were seeking safe anchorage during refit or repairs.

On his return to McGill, his first problem was the detection of the electric effect of trains passing beneath the Library; a problem which he solved with his usual thoroughness and ingenuity.

At Cambridge he investigated the innermost regions of the atom, searching for the nature of the forces near the unseen nucleus.

Finally he became interested in the search for ore-bodies hidden and unseen beneath the surface of the ground. Last April, after a glowing account of Tasmanian flora and mineral wealth, he wrote to me, 'I am glad that you advised me to come, but I think there will be nothing to keep me from returning to McGill, once the work is done'.

'He revelled in the mysteries of these unseen regions, and now he has passed to the greatest mystery, to the secret which we too have to face; whether a perfect rest, 'a pulse in the eternal mind', or a continued personality in that transcendent region where there are many mansions.

'His faith in God and in our wonderful Universe was such that the transition would cause him more curiosity, to use a term reverently used by Charles Kingsley, than anxiety. Only three-quarters of an hour before his heart suddenly stopped beating he told the doctor that he was 'quite all right, and feeling fine'.

'There are young men whose lives have been singularly triumphant in a brief span of years. Mozart, among the very kings of music, had completed his work and his life at 35. Wolfe died far from his home, after a life full of difficulties and disappointments, but also of intelligent and strenuous training—victorious at the age of 32. Moseley, that meteor of science of immortal fame, took up arms at the outbreak of war, and gave his life at Gallipoli—almost a lad—at the age of 28. Keats,

perhaps the second of English poets, died at 26. Rupert Brooke too died at 28, after writing in 1914 those prophetic lines,—

If I should die, think only this of me
That there's some corner of a foreign field
That is forever England.

His grave is near the blue waters surrounding Scyros, where wild thymes and poppies blow; so also, outside the little city of Geraldton, among the hollows in the sand dunes, there is a corner of Australia that is forever Canada.

"Is it just to rank Bieler with this galaxy of bright spirits? Yes! He too has achieved a lasting niche in that temple of fame at least a little dear to those who give their lives to searching the unknown. 'That last infirmity of Noble mind'.

"Let it not be thought, however, that Etienne Bieler was merely a man of science; he was more! All the activities of life, at home, at work, at play, were followed with the same zest, enthusiasm and enjoyment, so that he was, as Bacon wrote, a 'full man', or, as Sophocles wrote, 'He saw life steadily and saw it whole'. He was keenly interested, too, in those things, and even more in those thoughts and ideals, which raise mankind in body and in soul. His faith was one of hope. It is hard to think, and not necessary to believe, that so active a personality is entirely at rest. So that we will not say farewell, but rather pay our tribute to this man who gave his life in the fields of science, no less than Laurence Binyon paid homage to those who fell in battle, when he writes in his poem, 'For the Fallen',—

They shall not grow old, as we that are left grow old,
Age shall not weary them nor the years condemn,
At the going down of the sun and in the morning
We will remember them."

Une Feuille d'anniversaire.

Naitre, vivre, mourir, c'est le destin des hommes,
Le secret de la vie et le dessin de Dieu;
Tout ce que nous étions, et tout ce que nous sommes,
Tout ce que nous serons, en trois mots, qui c'est peu!
. (Henni Duand.)

*Birth, life and death!
They are the fate of men,
Time's secret, the design of Deity.
All that we were, all that we are—again,
All that man here can be.
Three words express—'Tis little!*

N'oublions pas ceux qui ne sont plus là; mais que leur
présence idéale, au lieu d'être une peine, soit une consolation
(Materlinck, *Le temple enseveli*)

En s'en allant, ils nous ont laissé le plus pur de ce qu'ils
furent, ne perdons pas dans les mêmes ténèbres ce qu'ils nous
ont laissé et ce qui la mort a pris. (Idem)

*Let us not forget those who are no longer here, but let their ideal presence, instead of being a pain, be a consolation.
In passing hence, they have left to us the purest of what they were. Let us not lose in the same darkness that which they
have left behind and that which death has taken away!*

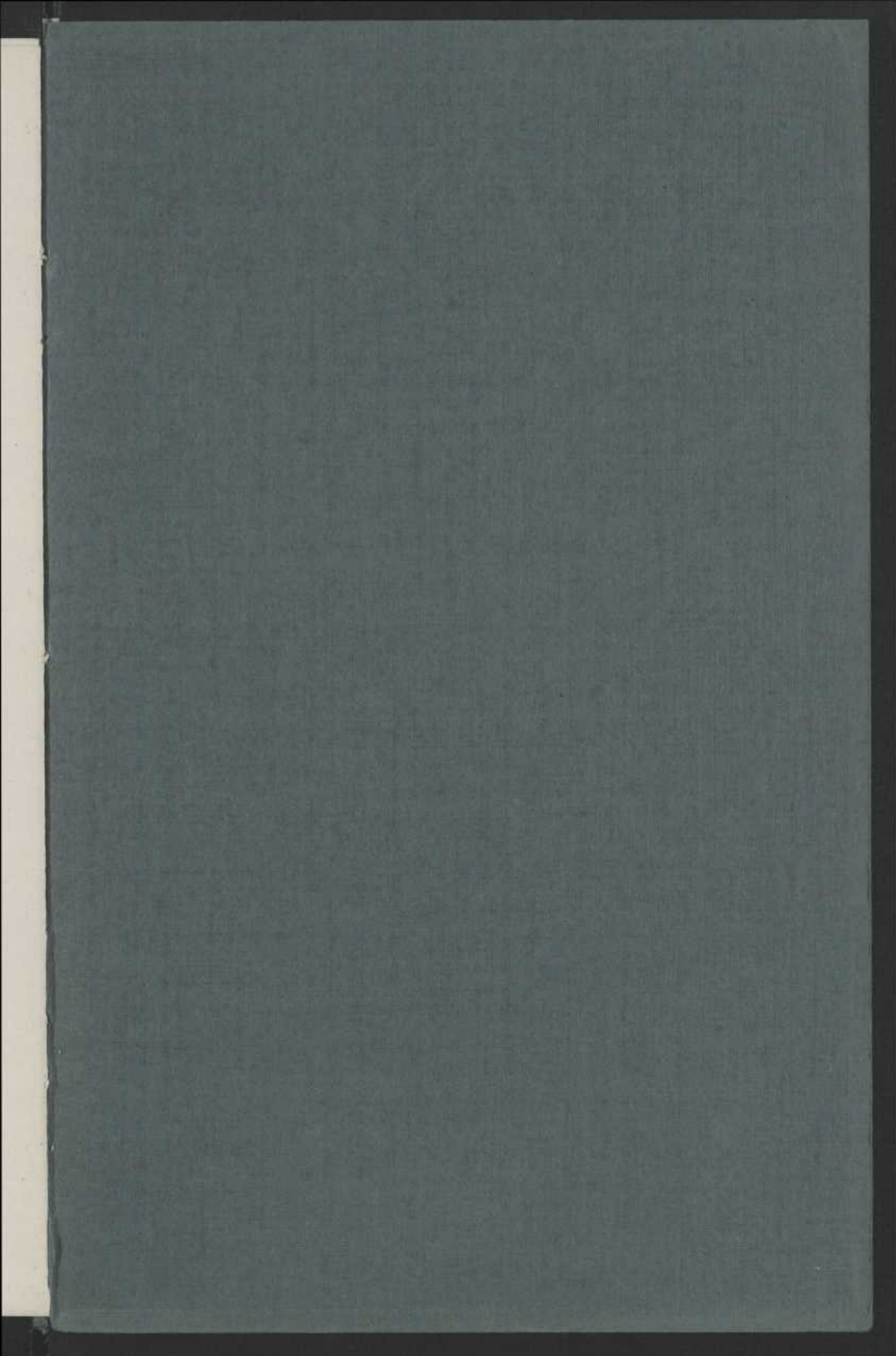
*It is a strange coincidence that these citations should have been copied by Etienne Bieler at the eve of his departure for Australia. However, as
they were chosen for a special purpose, there can be no ground for attributing the choice to sombre forebodings.*

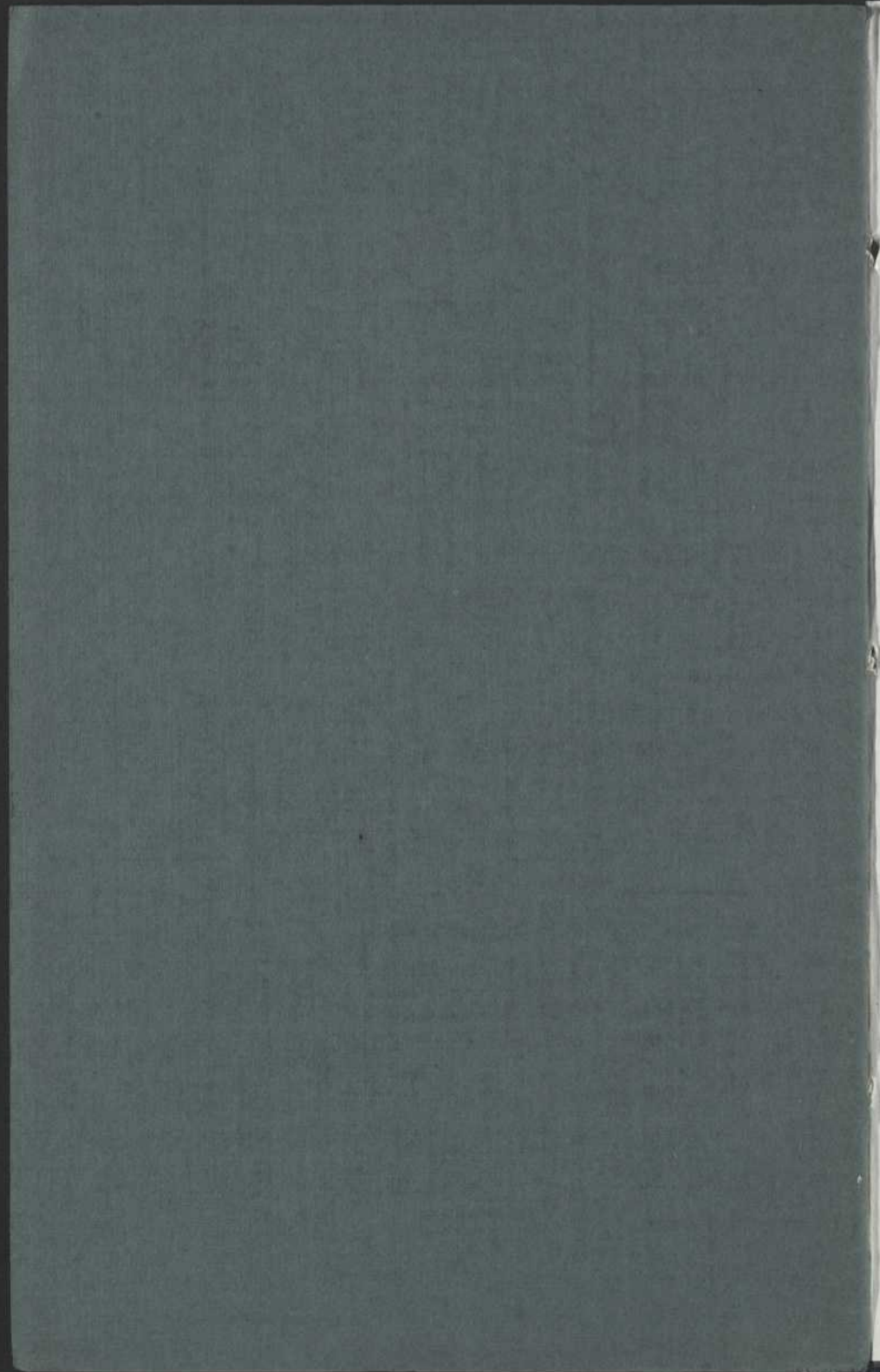
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