OBITUARY NOTICES.

ERNEST EDWARD MABBOTT.

BORN JULY 21ST, 1904; DIED JUNE 6TH, 1929.

ERNEST EDWARD, a son of Charles William and Emily Mabbott, was born at Edmonton in 1904, and spent his schooldays at the Grammar School, Enfield. In 1922 he entered East London College. From the beginning of his college career he was very popular with both students and staff. He was always cheerful, always courteous. He was an exceptionally good student, and chemistry came easily to him, for he was fond of it. He also played well: he was a cricketer, and was in great demand at college functions because he could sing. No one hearing him sing would have suspected the student of chemistry; no one teaching him chemistry would have suspected that this quiet studious boy was indispensable when a Gilbert and Sullivan opera was being produced by the students.

As I have said, chemistry came easily to Mabbott. After two years at East London College he secured the B.Sc. degree (First Class Honours), and then took up organic chemical research. He was of that rare type of chemist to whom luck seems to come from the first. Or, perhaps, his hands were as good as his brain. I still recall the pleasure of hearing what the distinguished External Examiner had to say when Mabbott went up for his M.Sc. examination, and passed. His work was published in a conjoint paper in the Journal of the Chemical Society, and he was elected a Fellow in 1925.

Mabbott had all along intended to become a chemistry master and he soon secured a good post at Pocklington School, Yorkshire. Just before he took his Master's degree, he was gassed with phosphorus tribromide, but he made light of it, and protested that he had suffered no lasting ill-effects. Yet later he showed signs of lung-weakness, and it would seem that the accident had aroused a sleeping malady, since for the next twelve months he was in the doctors' hands. In 1926, being apparently quite recovered, he spent a year at London Day Training College, and later became a master at his old school.

In September, 1928, he was again taken ill. At no period was he other than cheerful, and it was so until he died last June. It can be said not only that he was incapable of doing or thinking harm, but also that no one who knew him could fail to benefit from the association.

E. E. TURNER.

FRANCIS EDWARD MATTHEWS.

BORN JANUARY 31ST, 1862; DIED FEBRUARY 24TH, 1929.

FRANCIS EDWARD MATTHEWS was one of that comparatively small band of later Victorian chemists who, without being conspicuous or widely known to the general public, did invaluable service to English chemistry by the assiduity and meticulous care expended on their work, whether teaching or research simply or in connexion with a technical process.

He was the son of Benjamin Matthews, a London merchant, was born on January 31st, 1862, and received his early education at University College School, Gower Street, then at University College, and later at the Royal College of Chemistry, South Kensington. There he worked in the laboratory, but did not attend lectures or take any of the examinations. The progress he made in a short time drew from one of the professors the expression of Shylock's " how much elder art thou than thy looks." He was then between 18 and 19 years of age and had a greater command of mathematics than most students considerably older, in addition to a very clear and extensive acquaintance with chemical and physical theory.

At that time he had a remarkable power of being able to perform, in some mysterious lightning-like manner, calculations such as are required in a physical or chemical laboratory, to the utter confounding of some of the other students. To be told the percentage composition, and often the empirical formula of a substance almost as soon as the analysis figures were put down acted in some cases quite disconcertingly on the man doing the analysis, especially if it happened to be a combustion for carbon and hydrogen.

From the Royal College, Matthews went to Bonn and there seems to have become a favourite pupil of Kekulé. In the few years he was in Bonn he either developed or caught the invaluable habit of reading and keeping abreast of chemical literature: this he continued to do until the end, and so thoroughly that there were few works published here or abroad about which he was unable to give a concise digest. From his correspondence he seems to have been fascinated with the work in hand and he must have made rapid advance and obtained a high position in the esteem of the professors to be able to take his degree " summa cum laude " before he had reached his twenty-first birthday.

Afterwards Matthews returned to the Royal College and acted as voluntary (unpaid) assistant during several years. No doubt at that time he would have had better scope for his abilities in a works, but the time of the chemist in works was not yet come. After a few years at the College he joined the Royal Indian Engineering

College, Coopers Hill, Egham, as assistant to Professor McLeod. During the time he was at Kensington he took a great interest in the sports and activities of students of the Royal School of Mines and the Royal College of Chemistry and the Art Department Students, and this side of his activity was carried on with no diminution of energy with the students of Coopers Hill College. Matthews remained at Coopers Hill for about 20 years until that Institution was dissolved, succeeding Professor McLeod when he was retired on attaining the age limit.

During the time he was assistant to Professor McLeod his quick calculating power gave rise to amusing incidents. Professor McLeod was very much " taken " by the behaviour of a calculating machine which had been presented to the College by Lord Rayleigh. Matthews and the machine had races in doing sums and often the machine came off quite second in time and, it was quaintly hinted, now and then in results also.

After the dissolution of the Royal Indian Engineering College at Coopers Hill, Matthews turned to what must have been a desire in early life, *viz.*, technical problems, and for some time isoprene and its conversion into artificial rubber, at the suggestion of Sir W. Tilden, Sir W. Ramsay, and others, engaged his attention. In connexion therewith he noticed the polymerising action of metallic sodium on some unsaturated hydrocarbons and devised, or suggested, methods for its application to artificial rubber production. A number of other problems, such as the production of ribbon metals, which promised to develop technically, took up his attention until the approach of the period 1914—1918, when most of them were abandoned by the firms which originally were likely to be interested.

In 1914 Matthews joined the firm of Matthey and Johnson, with which he remained to the end. I give below a letter from Messrs. Matthey and Johnson, who remark on a happy, genial, and at the same time serious and cultivated manner and personality which rendered him a respected and loved associate :—

" *The late Dr. Matthews and Johnson Matthey & Co., Ltd.*

" Dr. Matthews was known to a few members of the staff a few years before the war, when his advice had been asked from time to time in an unofficial capacity, but it was in 1914, when for obvious reasons the staff was depleted and more technical problems arose, that he was called in as consultant chemist.

" From that time until a few days before his death he had imparted his most useful knowledge in a whole-hearted manner.

" All those who were connected with him at Johnson Matthey

& Co., Limited were impressed by his kind manner and willingness to help in any capacity within his power.

" He was extremely interested in the younger element and would encourage any of those who showed aptitude for learning. The fact that he had been a student of Kekulé, and had had many years' experience as lecturer at Coopers Hill College, made his knowledge of organic chemistry and other subjects extremely useful to the academic aspirant.

" The charm of his personality will always be remembered by his colleagues, who greatly deplore his passing."

His widow and one son survive him : the younger son died whilst on duty in America during 1914—1918.

W. R. H.

JAMES MOIR.

BORN DECEMBER 14TH, 1874; DIED MARCH 30TH, 1929.

JAMES MOIR, elder son of James Moir, Rector of Aberdeen Grammar School, was born at Banff. He entered Aberdeen University in 1893 and graduated as M.A. and B.Sc. in 1897. For three years he acted as a demonstrator in the Chemistry Department of Aberdeen University and during this period he carried on research work on amarine with Professor F. R. Japp.

In 1900 Moir was awarded an 1851 Exhibition Scholarship and during the tenure of this at the Central Technical College he carried out, under the guidance of Professor H. E. Armstrong, an investigation on some cyanohydroxypyridine derivatives of diacetonitrile. In the course of these investigations he had occasion to prepare a considerable number of organic compounds requiring complicated synthesis and he acquired a striking facility for this type of chemical work.

In 1902 the University of Aberdeen conferred on Moir the degree of D.Sc. For health reasons he sought the sunny climate of South Africa towards the end of 1902 and for a short time acted as science master at one of the Johannesburg schools. For about a year he acted as a chemist in the laboratory of a gold-mining company and in 1904 he was appointed chemist to the Transvaal Department of Mines. His association with the gold-mining industry led him to investigate the chemistry of the extraction of gold by cyanide solution and later he contributed to our knowledge of the character of the dust particles found in mine-air (after blasting and crushing operations) which cause silicosis.

Moir continued to carry on small investigations on carbon com-

pounds and published contributions on coerulignone, derivatives of diphenol, diphenoquinone, tetrabromodiphenoquinone, and oxidation products of dianisidine. In 1910 he evolved a theory of atoms, according to which all the elementary atoms are built up of elements of atomic weight 1, 2, 3, or 4; he presumed that, since the "four affinities of carbon are equal in strength and space-direction," the atom is built up of four sub-atoms of atomic weight 3. The theory was purely speculative and arithmetical; our advancing knowledge of the structure of the atom shows that it had no foundation.

Moir was fortunate in possessing a great facility for devising characteristic reactions (chiefly colorimetric) for the detection of specific substances and he evinced a large interest in the colorimetric method of determining the hydrogen-ion concentration of solutions.

In 1914 the position of chemist to the Department of Mines was abolished and Moir joined the staff of the Government Analyst at the Government Chemical Laboratories at Johannesburg, a position which he occupied for nearly fifteen years until his death.

In 1918 he began to investigate the connexion between the colour of organic substances and their constitution; the results of his labours in this direction were published in a series of twenty-five short communications to the Royal Society of South Africa and nine contributions to the Transactions of the Chemical Society. For the purpose of his investigation he prepared a very large number of phthaleins as well as a number of mono- and di-cyclic coloured compounds, and he established that the shift of absorption band caused by substitution depends upon the volume, and not upon the weight, of the substituting element or group. He arrived at empiric conclusions regarding the amount of the shift of absorption band caused by replacement of a hydrogen atom by some other element or by an organic radical and so was enabled to calculate the position of the absorption band (and so approximately the colour) of a compound from its constitution.

The South Africa Medal (founded in commemoration of the visit of the British Association to South Africa in 1905) was awarded to Moir in 1919: the medal, and the annual income of the fund, are awarded by the South African Association for the Advancement of Science for achievement and promise in scientific research in South Africa.

Moir was never in robust health and he eschewed all sport and outdoor games; he was an ardent amateur astronomer and took great delight in pursuing this science as a hobby. He took an active interest in local scientific societies.

J. McC.

THOMAS BURR OSBORNE.

DIED JANUARY 29TH, 1929.

THOMAS BURR OSBORNE was elected an honorary Fellow of the Chemical Society in 1912 and his death on January 29th, 1929, removes one of the most distinguished figures in American biochemistry. The Chemical Society has seldom honoured with its honorary Fellowship investigators whose work has been concerned chiefly with the biological side of chemistry, thus Osborne's election was an exceptional tribute to the scientific worth of his labours.

Osborne's scientific life was entirely centred around New Haven. A student of Yale University, he received the degree of Ph.D. for a thesis on "The Quantitative Determination of Niobium." In the year following graduation he was invited by Professor S. W. Johnson to join the staff of the Connecticut Agricultural Experiment Station, thus forming a connexion which he maintained throughout life. Up to this time Osborne's work had been entirely concerned with analytical chemistry, and the cause of his deflection to biological chemistry may not improbably be referred as much to the heart as to the head. His devotion to Johnson, himself a pupil of Liebig and for long one of the outstanding leaders in agricultural science, and his subsequent marriage to Professor Johnson's daughter combined to make the transition an easy one.

In broad outline Osborne's contributions to biochemistry may be considered in three main groups. First, the preparation of many proteins, especially those found in vegetable seeds, in a state of relative purity quite unattained by previous investigators. Many of these proteins were obtained in crystalline form and characterised in a thoroughly convincing fashion. Having the command of relatively pure proteins in large amounts, Osborne devoted the second phase of his work to the analysis and identification of their products of hydrolysis: the results are of permanent value and are constantly utilised by others, but it may be conceded that the methods made use of were chiefly worked out by Kossel, Fischer, and others and that Osborne's own contributions to methods of protein analysis seem modest in comparison with his other outstanding accomplishments. The third and certainly the most striking part of Osborne's work dealt with the biological properties of his highly purified proteins: first of all in relation to their specific antigenic properties and their ability to produce that extraordinary phenomenon known as the anaphylactic reaction—and subsequently their rôle in animal nutrition. The latter phase of Osborne's work brought into prominence the importance, from the standpoint of nutrition, of minute amounts of substances associated in varying

degree with certain foodstuffs which are now grouped under the name of " vitamins." In particular he contributed largely to the discovery of the substance present in butter fat which was later distinguished as vitamin *A* and is essential for animal existence.

In the following year the important observation was made that the same stimulation of growth could be secured by the addition of cod-liver oil to a diet of purified food substances and protein-free milk, a discovery which served to focus attention upon the value of this oil, in particular as a curative agent for the peculiar eye condition known as xerophthalmia, which was regularly encountered in animals on the deficient diets. At the close of the war the sight of many children in Europe was preserved by its use, a remarkable example of the application of scientific results to practical problems.

One of the results of the study of vitamins was a clear conception in Osborne's mind of the importance of an investigation of the constituents of living cells. This led to a vast amount of labour upon the composition of green leaves, much of which did not reach the stage of publication. He enthusiastically co-operated in the abours of his assistants in this field and the work strikingly demonstrated the complexity of the chemical environment in which the life process takes place. Osborne's investigations in the field of protein chemistry were summarised in his well-known monograph " The Vegetable Proteins," first published in 1909, and extensively revised in 1924. His monograph on " The Proteins of the Wheat Kernel " (1907) is a standard work of reference among chemists who are occupied with the problems of cereal foods. His published work includes nearly 250 journal reports as well as public addresses and more popular articles. Shortly before his death Osborne published jointly with his colleague and successor, H. B. Vickery, a monograph in *Physiological Reviews* entitled " A Review of Hypotheses of the Structure of Proteins," which must be regarded not only as a confession of faith but as one of the sanest and most wisely critical essays on a most difficult subject. His last paper on " The Chemistry of the Cell " concludes with the following sentence, which is so typical of Osborne's scientific caution and dislike for premature speculations that it may be quoted : " I fear that for a long time to come much will still remain to be learned about the chemistry of the cell, but if, in the meantime, we can extend our knowledge of this subject it may save us from many erroneous conclusions based on incorrect results obtained without sufficient appreciation of the real nature and complexity of the problem."

Osborne was singularly fortunate in his conditions of work and enjoyed happy associations with many colleagues of distinction, notably Gideon Wells, Mendel, Vickery, and Wakeman. His

extensive investigations would have been impossible without generous financial support and encouragement. Throughout the early years, when results came slowly and their application was by no means apparent, the directors of the Connecticut Agricultural Experiment Station allowed no interference or distraction to hinder the progress of the work. Since 1904 a large proportion of the financial burden has been borne by the Carnegie Institution of Washington, D.C., of which he was a research associate. Osborne's connexions with both the experiment station and the Carnegie Institution of Washington furnish a striking example of the value to science of a policy of non-interference on the part of those in control of the distribution of funds for research. Except for routine annual reports, he was never asked for statements of progress or for outlines of projects. The relationship was always one of the utmost mutual confidence and esteem.

To those who were privileged to be associated with Osborne in his work he was a rare stimulus, a formidable opponent in argument, and an ever-genial but just critic. He frequently closed a discussion with the remark that facts were to be found in the laboratory, not in books. He was naturally shy and retiring, but among a small group of friends he showed himself as a gifted conversationalist, who was equally able to discuss the latest achievements of science, the current political situation, the intricacies of the world of finance, or the faults of the modern educational system. Few men have been more free from what Bacon has termed "the first distemper of learning, the studying of words and not matter."

H. D. D.

NOTE.—The writer gratefully acknowledges his indebtedness to Dr. Vickery's article on Dr. Osborne's work published in the *Yale Journal of Biology and Medicine*, March, 1929.

JOSEPH TCHERNIAC.

BORN DECEMBER 24TH, 1851; DIED DECEMBER 11TH, 1928.

THE death at Streatham Hill, London, on December 11th, 1928, of Dr. J. Tcherniac but a few months after the jubilee of his election as a Fellow of the Society, in 1878, brought to a close a life exceptionally fruitful in the domains of both pure and applied chemistry.

Born in South-western Russia, Tcherniac enjoyed an excellent preparatory education. His tastes were inclined at an early age towards chemistry. After mastering the elementary principles, he recognised the necessity of seeking in a foreign land more ample opportunities and a more stimulating atmosphere than his native country afforded at this period.

His choice fell upon Zürich, a peculiarly happy selection. In 1873, when he settled in the Swiss city, Victor Meyer, at the famous Polytechnic, had won a foremost place among the leaders of research in organic chemistry. Of marvellous creative and inventive talent, a wonderfully inspiring teacher, he had attracted a numerous group of young gifted chemists from many lands. Prominent among them were Otto Witt, later of London and Berlin, Emilio Noelting, subsequently the head of the famous École de Chimie, Mulhouse, Robert Schiff of Pisa, and Emil Kopp. For young Tcherniac, Victor Meyer had a very marked preference, and a close attachment arose between pupil and teacher, which matured into a life-long friendship, continued undiminished until the latter's untimely death.

At that period, interest in the Zürich laboratory was largely concentrated upon substituted derivatives of the aliphatic series, especially the nitro-compounds. Tcherniac's first three researches were made in this field, in conjunction with Victor Meyer, and were devoted to nitro-compounds and their bromine derivatives. They were quickly followed by a number of allied investigations, including work on malonic acid and the amines. Noteworthy was the introduction of the reaction with calcium hypochlorite, to substitute chlorine for hydrogen in fatty amines.

In 1874, the degree of Ph.D. was conferred on Tcherniac by the University of Zürich. The thesis presented in this connexion was entitled " Investigations regarding the Substitution of Aliphatic Nitro-compounds."

Like most young chemists of that day, he sought to broaden his outlook by study under another master of the science, and he chose Heidelberg, working there one semester under Bunsen. The writer's acquaintance with Dr. Tcherniac and life-long friendship began at this period.

The contact with Bunsen was inspiring, but Tcherniac's heart was never won for research in fields where the carbon atom was not dominant. At the close of 1875, he removed to Paris. In the laboratory of Adolf Würtz (École de Médecine) he found a warm-hearted and congenial welcome. The great Alsatian chemist honoured him all his life with his most affectionate support, and enlisted his active collaboration in the first supplement of his monumental " Dictionnaire de Chimie."

In 1877, Tcherniac equipped a private laboratory at 1 Place de la Croix Rouge. During his residence at Paris, a number of researches were completed, all in connexion with groups in the aliphatic series; glycols, glycollide, glycollates, malonic acid, derivatives of acetamide and of acetonitrile, thiocyanoacetone and homologues.

For the first time, however, the utilitarian and technical begin to play a distinct rôle.

Could the veil hanging over future events have been lifted by the young inventor, he would have seen that from the moment he entered the thorny path of industrial chemistry, nothing but years of heavy toil and bitter disappointment lay in store for him.

The most noteworthy product of this period was the manufacturing process for the synthetic preparation of potassium and other thiocyanates. By heating concentrated aqueous ammonia with carbon disulphide in an autoclave, ammonium thiocyanate is obtained almost quantitatively. This is easily transformed into the calcium salt, and that into the potassium salt. The latter, heated with finely divided iron, readily yields potassium ferrocyanide. A full description of the interesting process, amply illustrated, is given in the supplement of the " Dictionnaire de Chimie," page 594.

Several patents were secured, a company was formed, and works were established near Paris. In recognition of the introduction of this new industry, the French Government granted Tcherniac the exceptional honour of naturalisation by special decree.

The industry developed normally and the various products found a ready sale. Before the new venture had reached a fairly remunerative basis, the works were closed through lack of capital.

Had not Tcherniac's invention been so promising, he would not have felt such keen disappointment at the loss of the fruit of his five years of patient creative work. However, after a period of intense discouragement, he began to long for a new sphere of activity and a change of surroundings. He left Paris, chose a quiet rural spot not far from Toulon, and settled there with his family.

At that time, the phylloxera had ruined most of the French vineyards. Tcherniac's small estate had not escaped the general ruin. He found there nothing but vestiges of former flourishing vines. With his usual thoroughness and enthusiasm, he undertook the fascinating problem of recreating new vineyards by grafting choice French varieties on sturdy American vines. Experiment had already shown that this practice imparted the requisite vitality needed to resist the ravages of phylloxera. After several years of unremitting study and exhaustive experimentation at the cost of great physical strain, he had the satisfaction of beholding his vineyard perfectly healthy and productive.

The region considered him an authority on the subject. The Government rewarded him by medals, offered in two successive years.

But unmistakable signs of failing health began to make themselves felt. The intense summer heat rendered a return to a more temperate climate imperative. A longing to resume chemical activity was strongly seconded by his wife. It led them to bid farewell to

their lovely rural home with all its past associations. They settled in Southern Germany. A residence was found in the quiet university town of Freiburg in Baden. It offered exceptional facilities for chemical research. Here, a private laboratory was established from which issued, in rapid succession, a series of valuable researches.

Introduced by Professor E. Noelting of Mulhouse to Senator Scheurer-Kestner, owner of the well-known Fabriques de Produits Chimiques de Thann et Mulhouse, Tcherniac was promptly entrusted with investigations bearing on important problems. The beginnings were difficult. Remuneration was slight, and no assistant was provided. In less than one year, however, the reward came when he made the important discovery of the formation of phthalonic acid by the action of permanganates and manganates on naphthalene. This reaction was embodied in several patents. The resultant economical synthesis of phthalic acid remained for several years the most advantageous method in use, until it was superseded by the still less costly sulphuric acid process perfected by the Badische Company.

Subsequently the patents were transferred to the powerful "Farbwerke" at Höchst, and Tcherniac continued his research work under its auspices. The most important result was his synthesis of phthalchloroimide, and the discovery that that substance gave a theoretical yield of anthranilic acid by treatment with alkalis.

In the midst of activities concentrated upon the solution of problems in technical chemistry, time was occasionally found for research in purely scientific fields. Memoirs appeared on thiocyanoacetone, chloroimides, cyanogen bromides, hydroxymethylthiazole, and allied subjects.

In 1901, Tcherniac began in his laboratory an exhaustive study on the recovery of thiocyanates from waste lime, then produced in considerable quantities by gas companies. The results of this study were entirely satisfactory. Friends in England suggested that he should endeavour to get in touch with the South Metropolitan Gas Company, in which endeavour they actively assisted him. This ultimately led to his association with the above Company, whose distinguished Chairman, Dr. Carpenter, now kindly gives an epitome of the connexion of his Company with Dr. Tcherniac.

"My intimacy with Dr. Tcherniac dates from 1902 when I visited him at Freiburg to discuss his proposals to extract $Ca(CNS)_2$ from waste lime, then produced in large quantities by metropolitan gas companies. As a result he came to London two years later to take charge of the adaptation of his process to the large scale. Changes in the methods of coal carbonisation and gas purification some years later rendered unremunerative the extraction of the HCN from coal gas as thiocyanate and it was discontinued. But during the

years of our association I had come to have a high appreciation of Dr. Tcherniac's qualities. He was never at a loss for a 'way round' whenever any difficulty arose in adapting laboratory to large-scale requirements. He was besides a man of great personal charm and a *chimiste savant*, in the broad sense of the word."

During his nine years of arduous work at the South Metropolitan Gas Company, Tcherniac was fortunate in enjoying the unvarying sympathy and support of Dr. C. C. Carpenter.

In 1915, once more under extremely adverse conditions, partly owing to the war, Tcherniac resumed work as a consulting chemist and equipped the finely appointed laboratory at Streatham Hill, so familiar to his professional friends. During the first six months, he worked for Lord Moulton, then head of the High Explosives Department at the War Office. Tcherniac always felt very grateful to Lord Moulton for the kindness he showed him at that time and afterwards.

From 1916, Tcherniac was associated for 11 years with the well-known firm of Rowntree & Co. of York. He did for them an enormous amount of chemical research in his laboratory and many interesting and valuable results were obtained.

However, the time was nearing when his engagement with the firm had to be terminated. This took place in 1927. He always felt under great obligation to Mr. B. Seebohm Rowntree, chairman of the Company, for his unfailing sympathy and kindness.

In the last year of Tcherniac's life, again a vast amount of work was achieved, and all current investigations in his laboratory were successfully concluded. His inventive and creative powers were undiminished until, in the autumn of 1928, his strength began to give way. Medical aid seemed helpless to stem the rapid ebb of vital forces. He died after several weeks of terrible physical suffering, borne with admirable courage and in full possession of his wonderful intellectual vigour.

In reviewing a long career of over fifty years, one is impressed by the close, intimate, life-long ties which existed between Tcherniac and many of the noted leaders of our science.

Very reserved, almost shy, he was only at his best in congenial society and with those who understood his nature. With them, he felt unrestrained and his conversation exerted a captivating charm. Not only was he at home in manifold branches of human knowledge, but he had a wonderful gift of grasping essentials and expounding every subject in a lucid and attractive manner. His familiarity with chemical literature was exceptional. Aided by an unusually retentive memory, he had practically memorised all of Liebig's *Annalen* at the age of 23.

Tcherniac was fortunate in the choice of assistants and co-workers.

To these he gave of his best, training them to a high degree of technical skill and awakening in them much of his own love for pure chemistry.

His pronounced taste for literary masterpieces, combined with unusual linguistic talent, led to a remarkable facility of expression in English, French, and German. His numerous scientific memoirs written in the three tongues exhibited a purity of idiom, a grace of diction, and a richness of vocabulary seldom possessed by the native-born chemist of the three countries in question. I often marvelled at his extensive acquaintance with general literature, with all that was noteworthy among French, English, German, and American works. One of his hobbies was the collection of first editions of British authors. His only recreation was chess, for which he possessed a remarkable skill.

Throughout life, he was a member of the Chemical Society and of the Deutsche Chemische Gesellschaft.

Tcherniac's life was full of discouraging obstacles and disappointments. Like other chemists, he had to witness promising inventions successful for a few years and then superseded, in this remorseless age of quick succeeding discovery, by other more effective processes. In all these varied crises, he displayed an extraordinary courage, an indomitable energy, and an ability to parry the reverses of fortune which awakened the admiration of his friends and elicited their cordial support. Unquestionably the chief source of his strength lay in a family life of singular charm. Married young to Pauline Brodsky, daughter of I. M. Brodsky of Kieff, he found in his wife a helpmate whose many attractive qualities and resolute character contributed largely to the happiness of her husband.

Mrs. Tcherniac was endowed with much of his literary taste and linguistic talent. Possessed of great tact and social charm, she was a genial hostess to the many professional friends who frequented the Tcherniac home.

Their union was blessed with nine children, in whose companionship Tcherniac found his chief joy and association. Bereavement cast too frequent shadows on these delightful relations.

Tcherniac loved nature and never ceased to meditate on her immutable laws and impenetrable mysteries. In his dreams, he often saw the peaceful retreat he had left so many decades ago, the vineyards, olive groves, and shady fig trees, a true image of Biblical scenery. He often said that the happiest years of his life were those spent in rural pursuits and in constant communion with nature.

THOMAS H. NORTON.