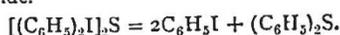


to a colourless oil consisting of iodobenzene and ordinary phenyl sulphide.



*Reduction of the free base* is brought about by the action of sodium amalgam in the cold, a molecule of the base decomposing into benzene, water, and hydriodic acid, which latter precipitates a second molecule of the base as the insoluble iodide.



The solution of the free base precipitates solutions of the salts of the heavy metals exactly like ammonia or the fixed alkaline hydrates.

*The physiological action* of the chloride of the base has been studied in detail by Dr. Gottlieb, of the Heidelberg Pharmakologisches Institut. The salt has been found to be very poisonous, and its mode of action upon the animal muscles, membranes and nerves, combines the characteristics of the action of lead and thallium salts with those of ammonia and the ammonium bases. A. E. TUTTON.

### WOMEN AND SCIENCE.<sup>1</sup>

THIS little volume is to all intents and purposes a charming and eloquent appeal in support of the claims of women to effectual recognition in the scientific world. In reality it purposes only to give in brief outline the lives of half a dozen women who have rendered important service to mathematical science. But although brief the sketches are so clever that the various characters depicted could scarcely appear more living or real, whilst there is not a single dull sentence to be found in the book.

One of the most interesting of the short studies, because so closely connected with the present, is that of the gifted and fascinating Sophie Kowalevski, who only died three years ago, and who commenced her study of mathematics at the age of fourteen, and at eighteen married Kowalevski, "parce qu'il n'était permis qu'aux dames de suivre les Cours des Universités!" On the presentation of three original theses, the University of Göttingen hastened without further examination to confer the degree of Doctor of Philosophy upon her, and later in life she was appointed to a chair of mathematics in Stockholm. But Sophie Kowalevski was not only a gifted mathematician of whom Kronecker declared "l'histoire des mathématiques parlera comme d'une des plus rares investigatrices," but an accomplished *littératrice*, and the author of numerous books, one of which is entitled "Souvenirs sur George Eliot," whilst "Les Souvenirs d'enfance" is described as a fine bit of psychological study worthy of Tolstoi, or of the new "Immortal" Bourget.

The place of imagination in science, so forcibly insisted upon by Mr. Goschen some years ago in his rectorial address at Edinburgh, is beautifully put in a letter to a novelist friend astonished at her pursuing science and letters simultaneously. "People frequently regard mathematics as a dry and barren science. In reality the pursuit of mathematics demands a great deal of imagination, and one of the greatest mathematicians of our century said, with justice, that it is impossible to be a good mathematician without at the same time having a touch of the poet."

Some sixty or seventy years earlier we read of another highly gifted mathematician, Sophie Germain, who at the same time distinguished herself by her contributions to philosophy. M. Rebière tersely summarises her claims to distinction by thus closing his memoir: "Pour construire la tour Eiffel, les ingénieurs ont utilisé l'élasticité des métaux. On a inscrit sur la tour les noms de 72 savants; on a oublié celui d'une fille de génie, la théoricienne de l'élasticité!"

England is represented by Mrs. Somerville in a very bright and sympathetic little notice, whilst Italy sends her contribution in the shape of "la nobile fanciulla" Marie Agnesi, who Pope Benedict XIV. nominated Professor of Mathematics in the University of Bologna, writing—"It is not you who should thank us; on the contrary, it is we who owe all our thanks to you. From the most remote times Bologna has heard of people

of your sex occupying its public chairs. It belongs to you to worthily perpetuate the tradition." In commenting upon this distinction M. Rebière cannot resist telling us of some of the numerous women who have at various times held professorial appointments at Bologna. The list is instructive, and we quote it in full, for we cannot afford to admit women as fellows of any of our learned societies even!—"In languages, philosophy, and theology: Priscopia Cornaro, 'maîtresse des arts libéraux'; Clotilde Tambroni, hellenist, who had Mezzofanti as a pupil. In law: Dotta, daughter of Accurse; Biltizia Gozzadini, in connection with whom a pamphlet was published, *De mulierum doctoratu*; the two sisters, Bettina and Novella Calandrini. It appears that Novella was so beautiful, that it was necessary, in order to avoid distracting the students, to draw a slight curtain between her and the audience. In natural science and medicine: Alexandra Gigliani, Maria Petraccini, Anna Manzolini, and Sybille Mérian. The latter, who was a German, went to study insects at Surinam; she published an important work, and left her collections to the School of Bologna. In physics and mathematics: Laure Bassi, who married Dr. Verati, and who whilst teaching physics during forty years was a model wife and mother; and the two astronomers, Thérèse et Madeleine Manfredi, sisters of the Director of the Observatory, who published a volume entitled 'Astronomy for Women.'"

The bust of Marie Agnesi was subsequently placed by Cardinal Dumini in his gallery of distinguished Lombards, and on her tomb these words were inscribed: "Fille remarquable par sa piété, sa science et sa bienfaisance."

We are introduced to a very different woman and mathematician in the person of Madame la Marquise du Châtelet, the friend of Voltaire, and whom the Prince Royal of Prussia familiarly addressed as Vénus Newton!

M. Rebière tells us that she had preserved, in spite of her studies, "une certaine frivolité. Son goût pour la parure et les diamants était très vif. Et puis elle riait de si bon cœur aux marionnettes!" But whilst indulging in diamonds and puppet-shows, the Marchioness found time to translate Newton's "Principia" from Latin into French, and produced besides numerous learned memoirs, one of which, "Institutions de Physique," was dedicated to her sons in words which, although written more than a century and a half ago, might have been uttered yesterday—"J'ai toujours pensé que le devoir le plus sacré des hommes était de donner à leurs enfants une éducation qui les empêchât dans un âge plus avancé de regretter leur jeunesse, qui est le seul temps où l'on puisse véritablement s'instruire." We find her returning to the same theme in a little essay, "Traité du bonheur," a curious mixture of feelings reflecting very vividly the varying moods of this remarkable woman:—"Nous n'avons rien à faire en ce monde qu'à nous procurer des sensations agréables," she writes; whilst on another page we read, in an eulogistic commentary on the benefits of study more especially to women—"Quand, par hasard, il s'en trouve quelqu'une née avec une âme assez élevée, il ne lui reste que l'étude pour la consoler de toutes les exclusions et de toutes les dépendances auxquelles elle se trouve condamnée par état." M. Rebière does not omit to include amongst his memorable women Hypatia, with whose memoir the volume in fact opens.

In conclusion, M. Rebière devotes a couple of pages to suggestions for the making of a book which we fancy would be with difficulty kept within the modest limit of eighty pages, which the little pamphlet before us embraces. "Un livre à faire" remains, says M. Rebière, in which the influence direct and indirect exerted by women on the progress of science might be recorded, a book catholic enough not only to include the *savantes professionnelles*, but the *simples curieuses* or amateurs in science, amongst which George Sand finds a place, the *collaboratrices*, and finally those whose munificence and public spirit have earned for them the well-deserved title of *les protectrices*, instances of which we in this country have fortunately little difficulty in recalling. But possibly the most eloquent tribute which has ever been paid to any woman, and which might appropriately have found mention in M. Rebière's little volume, is that which was so pathetically inscribed by John Stuart Mill on the first page of his essay on "Liberty."

We are glad to learn that meanwhile M. Rebière is compiling a second and more elaborate volume in which women's relation to science will be discussed, upon which subject M. Rebière asks us to mention that he will gratefully receive any notes and suggestions.

G. C. FRANKLAND.

<sup>1</sup> "Les Femmes dans la Science." Conférence faite au cercle Saint-Simon le 24 Février 1894, par A. Rebière. (Paris: Librairie Nony et Cie, 1894.)