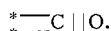


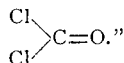
therefore no free affinities"? This example shows that the paragraph quoted above from p. 76 is much too dogmatic.

I do most strongly object to such a statement as that on p. 69, where, speaking of carbon monoxide, it is said:—

"The molecule of this compound is represented by the formula



Here the asterisks are intended to show that two affinities are unsaturated; this is proved by the fact that the compound unites with two atoms of chlorine, forming phosgene gas,



What is proved by the fact of combination with chlorine? No one can attach any clear meaning to the statement "two affinities are unsaturated." The only practical meaning these words have is, "The molecule CO can unite with two other atoms of certain kinds"; that is to say, the sentence quoted, when put into the speech of the plain man, asserts that the fact that CO does unite with 2Cl proves that CO can unite with 2Cl.

The later paragraphs, treating of the physical properties of bodies and the connexions between these and the constitutions of the same bodies, seem to me to be both very well done and very disappointing. They are well done because an earnest attempt is made to put the matter clearly, but they are disappointing because it is quite impossible to grapple with these very difficult matters in the space which is given to them in this book. I do not think that anyone will succeed in getting a grasp of Raoult's law from the pages which are grouped around paragraph 133. The application of Raoult's law to determine molecular weights, given on p. 137, is based on the constant '62°, which has been shown by van't Hoff and others to be erroneous.

But it is much easier to find fault than to compose such a book as this. A careful perusal of the work leaves the impression on my mind that, as a synopsis and suggestive remembrancer to the student who knows general chemistry well, this book will prove useful, but that it is too condensed and too slight to be of much service to him who is beginning the study of general chemistry. Most of the subjects dealt with cannot be made clear except by going into details, and illustrating them with considerable profusion. When one attempts to deal with these matters in a broad and general way, and at the same time to devote only a few pages to each section, one is almost obliged either to make statements so generalized that they are of very little use to the earnest student, or only to touch the fringe of each part of the subject. Chemistry is an abstract science to a much less degree than physics; hence such short statements as those which sum up and include in themselves whole provinces of physical knowledge cannot yet be made in chemistry. Where the "Outlines of Theoretical Chemistry" fails for the most part it fails because no book could succeed; it fails because it attempts to do that which cannot, at present, be done.

M. M. PATTISON MUIR.

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## THE TRAVELS OF A PAINTER OF FLOWERS.

*Recollections of a Happy Life, being the Autobiography of Marianne North.* Edited by her sister, Mrs. John Addington Symonds. In Two Volumes. (London: Macmillan and Co., 1892.)

MOST of the readers of NATURE will know without telling that Marianne North was a world-wide traveller, that she travelled in pursuit of nature, that she was an accomplished and faithful painter of plant and animal life, and that the results of a life's labour were presented by her to the nation, and now cover the walls of a building in Kew Gardens, erected at her expense. Most persons, too, who knew her personally—and her acquaintances and friends are as numerous as her travels were wide—will be glad to know something more of her history, and especially something more of her travels, of her impressions of peoples, of places, and, above all, her impressions of the plant and animal life of the many countries she visited and to which she gave her life. All who had the pleasure of knowing her personally will remember her stately presence, her kind face, her charming manner, and her entertaining conversational powers—now relating the difficulties and delights of her experiences in foreign lands, now her appreciation of home comforts and genial society. She wrote as she talked, and she was a fertile letter-writer; and she has written her book in the same style.

In early life Miss North made various journeys in Europe, and also went up the Nile and visited Syria, and painted many flowers; but with the exception of the Sicilian *Papyrus*, and perhaps two or three other little pieces, none of this early work is in the gallery at Kew. Only 38 pages of her book are devoted to her early life, and it practically begins with her more distant travels; the first long trip being to Canada and the United States, and extended to Jamaica, whence she returned to England. Two months later she started for Brazil, where she made a long stay, and then returned direct to England. The next journey included Teneriffe, California, Japan, Singapore, Borneo, and Java, and then home again. Her paintings attracted attention, and she complied with a request to exhibit some 500 of them at Kensington. This matter being arranged, she proceeded to India, landing on the way at Lisbon, Gibraltar, Malta, and Galle; and India was traversed almost from east to west and north to south.

The narrative of this journey is perhaps the most interesting part of the whole work. On her return home there was an exhibition of the accumulated paintings in Conduit Street; and a visit to Mr. Darwin, which ended in a determination to go to Australia and paint the flowers of the fifth quarter of the globe. It should be mentioned that in the meantime Miss North had adopted a suggestion of the *Pall Mall Gazette* that her paintings should find their home at Kew, and her generous offer was accepted. So it was, that when Darwin told her that her collection of paintings would be an imperfect representation of the vegetation of the world without the Australian element, she took it as a "royal command," and prepared to go forthwith. This journey some of the old scenes were revisited, brief halts being made at Galle and Singapore, a longer stay with the Rajah and Rani

Brooke in Borneo, and thence to Queensland. New South Wales, Victoria, West Australia, Tasmania, and New Zealand were successively visited; but incessant travelling, climatal changes, and continuous work had begun to tell on the constitution of this brave woman, who suffered much in the colder regions. Now, the great object was to make the collection of paintings as complete as possible, and she spared neither her pocket nor her person in trying to carry it out. Her book is so essentially the history of her gallery at Kew that one cannot dissociate them. The Australian journey was fruitful beyond all others, and the Australasian section of the gallery is perhaps the most attractive of all, being a marvellously complete representation of the varied and curious flora of that region. The homeward route was across the Pacific, calling at Honolulu, landing at San Francisco, and off at once to the redwood and mammoth-tree forests for more painting. Then across America by the southern route, and back to old haunts in the North-Eastern States, and home again to open the gallery, which had been built during this journey. Hanging the pictures was a most laborious task, from which Miss North took no rest. At this time the writer first made her acquaintance, and was engaged by her to botanize the paintings and compile a popular instructive catalogue. This occupied two or three months; and most interesting work it was, usually brightened by her presence.

No sooner was the opening of the gallery accomplished, than the terribly jaded donor of this munificent gift to the public began to think of visiting new regions to further enrich it. But I must be brief, for even to catalogue these journeys occupies much space. South Africa was next visited, and several months' uninterrupted work, much of it done under trying conditions of failing health, yielded so bountifully that it was determined to build a wing to the gallery, for the existing walls were already completely covered.

Miss North intended going from South Africa to Madagascar, but the means of communication were irregular and uncertain, and her health so bad that she returned home; but having to some extent recovered, she went the following year (1883) to the Seychelles, to paint the beautiful palms and screw pines of those islands. Even this did not satisfy her, and she started on her last journey in November 1884. Chili was her goal, and the principal object of this long journey was to paint the *Araucaria imbricata* in its home, as she had already painted the Brazilian and Australian species. She also succeeded in painting a considerable number of the characteristic types of the vegetation of that country. But this voyage, by way of the Straits of Magellan, tried her waning strength very much, and a less energetic person would have collapsed entirely. In the last chapter of her "Recollections" we read that all was enjoyment until they reached Bordeaux. "Then my nerves gave way again (if they were nerves), and the torture has continued more or less ever since." Beautiful Rio was touched on the outward voyage, and on the homeward route, by Panama, old friends were looked up in Jamaica. England was reached in the spring, and it cost another year to rearrange the gallery; the introduction of the South African, Seychelles, and Chilian paintings entailing renumbering throughout, in order to preserve the geographical order.

The foregoing is an outline of her journeyings, but the book should be got for the details, which are almost always interesting, often clever and quaint. Here and there one meets with uncompromising criticisms and descriptions of persons that might have been expunged with advantage. The descriptions of the vegetation of various regions, with particulars of the principal elements, are pleasant and instructive, often containing much original information; and will be greatly appreciated by those who frequent the gallery at Kew, of which the book, as already stated, contains the history.

After completing her work at Kew, Miss North took an old-fashioned house at Alderley, in Gloucestershire, where she formed a charming garden; but her constitution was broken, her sufferings increased, and she died in August 1890.

W. B. H.

#### AMERICAN TOWN TREES.

*Our Trees.* By John Robinson. (Salem: Horton and Son, 1891.)

THIS short account of the trees of an American town and its neighbourhood consists of reprints of newspaper articles written in 1890-91 for the benefit of local readers: they have been re-compiled into book form at the request of the directors of the Essex Institute, and date from the Peabody Academy of Science, Salem.

Several points strike a careful reader of the book. The writer draws special attention to the fact that the articles, or chapters, are not intended as botanical essays; and the reader will probably decide that the remark was unnecessary, for a more unscientific work dealing with a scientific subject would be difficult to find; but there is a peculiar charm in a certain style of talks about natural objects—for instance, in some of the more chatty paragraphs of White's "Selborne," or Walton's "Angler," and even Evelyn's "Flora"—which attracts the most devoted student to refreshing looks around his subject-matter from every-day points of view, and this little work possesses that charm. Few facts of scientific importance are met with in such writings, and still fewer of the generalizations which make science what it is: the specialist may even deride the writing as "talker-talker"—gossip, if you will; and even the broadest thinker may be inclined to wonder why such articles are written; all this, and more, may be true, and yet—there is the charm, nevertheless, and it is very apt to seem appropriate where trees and flowers are concerned. Whether it is advisable that such writings should increase is a matter likely to settle itself, simply and certainly, because very few can produce them. A scientific work, then, this is decidedly not. It is a series of homely chats about trees, by one who knows and loves them. The latter fact leads to another—namely, that such a writer cannot help telling you something worth learning even though it be by the way, and merely incidental.

In the first place we gather some ideas as to what trees are common in the streets and gardens of a Massachusetts town, and the evidently thriving condition of magnolias, sumachs, maples, witchhazels, mulberries, hickories, ginkgos, catalpas, sassafras, and many other beautiful trees, makes envious one who knows what difficulties are