Then he whipped an old envelop out of his pocket and made some hasty calculations on it with his lead pencil. Meanwhile she walked to the graphaphone and put on a record.

When she returned to the sofa, he handed her the calculations. While she pondered over them half-heartedly, he drew a diamond ring from his pocket and furtively polished it on his coat sleeve. She lost interest in the figures at once, for the ring is mightier than mathematics.

After the ceremony, they were handed a certificate bearing a combination of neat printing and bold black signatures.

They went on a honeymoon in an automobile, riding over tar-bound roads on new balloon tires. The car was new, so that no trouble was experienced on the trip from carbon in the engine cylinders.

They moved into a small brick house laid up with black mortar, and, of course, lived happily and so on, although their soft coal furnace sometimes smoked and deposited soot on the walls and window curtains.

This might be called "A Rhapsody in Black," but it should more fittingly be entitled "The Romance of Carbon." How many uses of carbon feature therein? The anonymous writer has counted in it seventeen distinct references to the element itself, exclusive of its compounds.

After reading the printer's ink on the remaining pages of this issue of the Chemistry Leaflet, sharpen up the graphite of your "lead" pencil and see if you cannot find more than seventeen references to carbon in the above romance.

* * *

THE FORMS OF CARBON

Carbon is one of the most interesting of the ninety-two chemical elements. One of the most remarkable things about it is the fact that it exhibits *allotropism*, that is to say, it has various physical forms.

This leads us to the point that the chemical constitution of an element is not the whole story of its appearance or behavior. The manner in which the atoms are arranged with respect to each other will completely alter the physical nature of the specimen. Elements which have several allotropic forms are not uncommon although carbon presents the most striking example of this type of element.

The diamond is hard because of the peculiar way in which it crystallizes. It is found in what is known as the diamond modification of the cubic system, which has one carbon atom at each point of a tetrahedron, and one carbon atom in the center. This fact was not definitely known until the introduction of the X-ray, because no microscope is able to give sufficient magnification to show the arrangement of atoms. The crystals of uncut diamonds are built up by millions on top of millions of carbon atoms congregating together, all in an arrangement with respect to each other similar to that of the sketch on page 11.

Graphite, on the other hand, has the carbon atoms arranged hexagonally in rather widely separated planes. This is best seen by a study of the aforementioned diagram.

The graphite arrangement gives us layers of material, a fact which accounts for the so-called flakiness of graphite. The diamond will withstand unbelievable strain, while the graphite planes slip over each other easily, giving graphite its lubricant qualities.