five of its atoms are used up, exploded in exertion, and its limit of exhaustion has been reached. Plainly, these twenty-five atoms should be regained during comparative quiescence by other than toxic or asphyxiating means. In short, the cell eats while the colonial activity ceases, and this is the meaning, the end and aim of sleep. If, in addition, twenty five more atoms enter into the combination, making it a still more complex molecule, a margin of fifty atoms may thus be imagined as enabling extra exertion within safe limits. Destructive metabolism could be supposed to ensue from several hundred of these atoms being parted with.

The chemic composition of the hypnotics affords no clue to their *modus operandi*. The mere presence of nitrogen in many is negatived by this element also occurring in ammonia and thousands of compounds with varying properties. Chlorin also appears as a food constituent in salt, as part of the anesthetic chloroform, and as a suffocant in its gaseous form. Neither the number nor the position of the atoms of carbon, hydrogen, nitrogen and oxygen in morphine explain why it differs from quinine which also contains these elements in other proportions.

Neither complexity nor simplicity of atomic combination guarantees any explanation of the mocular rationale, but in a general way the more useful drugs have a constitution admitting of more or less direct conversion into animal constituents, and yet this is far from being a safe universal guide, for some of the deadliest poisons, even in small quantities, resemble foods in their chemic structure.

In some instances, solubility modifies actions materially for better or worse, in others the looseness of the atomic make-up explains some effects, and the resistance to atomic splitting up, or the temperature necessary for decomposition, explains other effects. With what knowledge we possess we can formulate something in general from specific instances :

Alcohol, $C_2 H_6 O$, is rapidly assimilated and in a certain sense is a food. This rapid assimilation by reconstructing the tissue could account for its stimulant effect, and when there had previously been cell waste upon whieh the insomnia depended, the sleep-inducing properties of alcohol are accounted for. The stupidity that follows over-indulgence is precisely what would occur from cerebral tissue surfeit.

Morphine, $C_{17} H_{19} NO_3$, upon thorough consideration also falls into this dangerous food category. It, with alcohol, though less rapidly, enters into molecular combinations with nerve tissues and induces a certain exhilaration and subsequent dulling of the senses.

The exhilaration caused by oxygen and the stimulant effects and later anesthesia of nitrous oxide gas, without doubt are owing to the rapid assimilation of these articles by the blood and and nerve centres. The stimulant effects of all these agents could be ascribed to rapid atomic interchanges, such as occur with less swiftness and danger in the ordinary course of nutritive supply.

The warmer blooded birds take up oxygen more rapidly than mammals, and far more so than reptiles. The acidity of muscle and nerve substance in connection with blood alkalinity renders possible the conveyance of alkaloids, and make it likely that soluble alkaloidal hydrocarbons of the neurotic group, assimilable by the organism, have sufficiently close molecular resemblances to the acid protagon as to account for their mutual affinities and bio-chemistry.

In the constitution of protoplasm, as well as that of any compound whatever, there is a necessity for the absence of certain molecular groupings which destroy the combinations if integrity is to be preserved. The cell environment is reached by adaptability, and in the differentiation of cells, it is easily seen, that what would be nutrient to one may easily poison another by combustion conversion, as with sulphuric acid, or affinities in lesser degree existing between the toxicant and molecule.

The life of the cell depends upon the absence of these deleterious molecules for which there are affinities, precisely as animals must avoid fire. Prussic acid, H C N, presents the simplest example. The nitrogen therein is in a dangerously assimilable form, and its sudden surcharging of nerve centres with carbonized blood paralyzes the body. Even though the venous blood occurs after prussic has first caused the blood to appear to be arterialized, at least destructive chemic changes are instantly induced by this simply constructed poison. The action of nitro-glycerin and amyl nitrite exhibit the swiftness of union between the nitrogen and important structures. Nitrogen has a persistent tendency towards its free inert state, and this very disposition confers upon it great physiologic importance. On the other hand, oxygen has a great antipathy to uncombined existence. These two mechanically mixed ingredients of the air play complementary parts in biologic phenomena.

Certain drugs have special affinities for certain groups of nerves, and white pigs and sheep are said to be differently affected by vegetable poison from colored individuals, a fact accounted for, doubtless, by the presence or absence of pigment compounds, which have affinities for or resist the influence of certain poisons.

The antidotal action of chlorine gas in prussic acid poisoning may be due to the former directly lessening the surfeit (so to speak) imparted by the hydrocyanic acid. The sedative property of