suggested is ever followed or not, it is at least fairly clear that the use of symbols in the various special and restricted subjects can be regulated with far less perplexity and conflict than attends the attempt to provide a single system to fit the whole of a very complex science. Another important conclusion is that voluntary effort and cooperation can accomplish much, even without any formal committee. For instance, most of the existing diversities in symbols are due to inadvertence or negligence, not to real difference in opinion or taste. Most of them would have been avoided if writers had simply made it a rule to notice the symbols of their predecessors, and not make changes without any reason. There is little doubt that the majority of writers are willing to follow this rule as soon as their attention is directed to it. Where previous usage differs, or where some writer wishes to make changes for a reason, the individual writer's judgment may not be wise. In such cases cooperation, through correspondence or otherwise, between different writers is advantageous. Such cooperating writers, however, will usually desire the cooperation of a formal committee. Indeed, my own reason for venturing to present these suggestions to the public is that I happen to belong to a small group who are willing to make mutual concessions and so secure a uniform set of symbols in a new minor subject, and who wish to have their work in this direction given the improvement and greater promise of permanence that would come by having it passed upon by a recognized committee.

The symbols used in diagrams, and in many cases the forms of the diagrams themselves, can also gain by standardization. Certain familiar conventions have long been used in electrical diagrams, but in general the field is so divided and varied that here, even more than with the symbols used in equations, piecemeal and detailed standardizations seem at once easiest and most useful. Sweeping and absolute rules are almost sure to prove detrimental in some cases, and have aroused opposition. Even in striving for uniformity the greatest uniformity is not necessarily always the greatest benefit. Moreover, a set of general rules, formulated once for all, does very little to unify the special and minor details, which are, if anything, the most important, since they are the most numerous, and hardest for the reader to remember. The value of general rules for symbols and diagrams will hardly be denied, but a large measure of attention to separate subjects seems likely at once to be of value in itself and to avoid much of the difficulty and conflict which have hitherto impeded progress in standardization of symbols by more wholesale methods.

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CARBON MONOXIDE

To the Editor of Science: One of the characteristic by-products of our industrialism is carbon monoxide and the mild hysteria which one finds in certain parts concerning the possible accumulation of this compound in our atmosphere is interesting as an example of a little learning. The report of the press that a high percentage of this gas was discovered in some of our camps where automobiles, aero-engines and gas engines in general were operating has given color to the fears expressed by some of our scientists who should know better. There is probably more carbon monoxide produced during a severe lightning storm in a given locality than is emitted by our coke burners, gas engines and other sources in industry during much longer periods. The silent discharge which proceeds during storms in mountainous areas produces much of the gas. Now while carbon monoxide is inert chemically and scarcely absorbable by ordinary laboratory methods, under natural conditions there are sources of disposal which guarantee that the gas does not accumulate rapidly, at least, in our atmosphere. Chlorophyll "fixes" carbon monoxide in a stable way, so that much chlorophyll is lost to plants in regions where there is an unusually high concentration of the gas, being rendered impotent in photosynthesis by the attachment of CO. In like manner, hemoglobin fixes carbon monoxide and in all probability a relatively large part of aerial CO is disposed of in this way. The hemoglobin binding CO is destroyed in the liver, the CO probably remaining attached to the protein end of the globin, and not to the biliary and urinary pigment which result from the decomposition of hemoglobin. The globin is excreted as urea, ammonia, etc., while some may be retained as amino-acid, but doubtless the CO globin is treated as foreign material and excreted. Another method of disposal of aerial carbon monoxide is the union in sunlight, with the halogens, bromine, iodine, etc., of our atmosphere and with the fluorine freed in the mountainous districts during storms involving lightning. In such cases, the carbon monoxide is converted to a carbonyl halide or to CO_2, in either case being capable of utilization by bacteria, plants with chlorophyll, etc.

The above communication was written previously to the publication of Lamb, Bray and Frazer's contribution from The Chemical Warfare Service entitled "The removal of carbon monoxide from the air" in the J. Ind. and Engineering Chemistry, March 1920, Vol. 12, p. 213.

W. M.

THE ATTAINMENT OF HIGH LEVELS IN THE ATMOSPHERE

To the Editor of Science: In the April 9, 1920, issue of Science, Dr. J. G. Coffin, on behalf of the Curtiss Aeronautical and Motor Corporation, questions the record of Major Schroeder, namely 36,020 feet, given in my brief review of high level records, in Science, March 19, 1920.

So far as I can now ascertain, Dr. Coffin is justified in questioning this particular record. The director of the Bureau of Standards informs me that the bureau has not yet determined the true altitude and that when determined it will be for the Air Service to make proper announcement. With such imperfect data, as I can now obtain, the approximate values are: Rohlfs, 9880.5 meters (32,418 feet); Schroeder, 9505.0 meters (31,184 feet). These are the elevations corrected for mean air column temperature, vapor pressure, gravity, altitude and latitude. The main reduction factor is of course the temperature. These results, however, must not be accepted as final. Until final and authentic data are forthcoming, the justice of Dr. Coffin's criticism must be admitted. The words "The record now stands—Schroeder, February 27, 1920, 10,979 meters" in Science, No. 1316, p. 288, should be accepted with reservation.

Let us hope, however, that before the end of summer both of these plucky aviators will have attained a true height of 10,000 meters.

Alexander McAdie

Blue Hill Observatory,
April 22

SCIENTIFIC BOOKS

Introduction to General Chemistry. By Herbert N. McCoy and Ethel M. Terry. Chicago, Ill., 1919. Pp. viii + 605.

The subject matter covered in the course in chemistry given to the freshmen class at the University of Chicago is the basis for this text-book. It does not aim to include all the material usually considered in a course in descriptive inorganic chemistry; the facts of the science are used primarily to illustrate fundamental principles and laws. A brief statement of the order in which the material is treated will bring out the point of view of the authors. The first chapter deals with the measurement of gases. In the next four chapters the fundamental concepts of the science are developed; these include indestructibility of matter, a pure substance, an element, analysis of substances, law of definite composition derivation of formulæ. Acids, bases, and salts, water and solutions, the kinetic theory and the atomic hypothesis are next considered. A chapter on chlorine and its compounds with hydrogen and metals is followed by a consideration of chemical equilibrium, oxidation and reduction, heat and energy. Three chapters are devoted to the ionic hypothesis and one to electro-chemistry. Nitrogen, phosphorus, sulphur and carbon and their simple compounds are then described. A rather long chapter on organic chemistry in which structural formulæ are