close to 900. Accordingly, it would seem that either the determinations for the combining weight were inaccurate, or fewer than five amino groups are free.

Although it is possible that circulin has a cyclic structure, the contentions that all its free amino groups are furnished by DABA, and that all DABA side chains are unsubstituted, still remain to be proved. This proof is prerequisite to the claim that an O-acyl, rather than an N-acyl, linkage exists between 6-methyloctanoic acid and the rest of the molecule. Moreover, one needs to demonstrate that the lipase preparation used does not hydrolyze N-acyl, as well as O-acyl, linkages. Isolation of the fatty acid and the intact peptide after inactivation of circulin by lipase, and demonstration that a hydroxyl group rather than an amino group becomes liberated during inactivation, are also necessary before any concept on the manner in which the fatty acid is attached to the rest of the molecule can be accepted.

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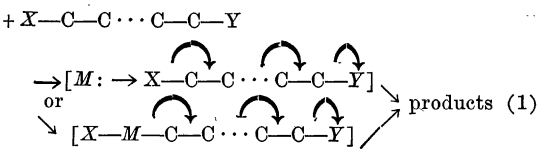
The Action of Metals on 1,4-Dihalides and Similar Compounds

A STUDY is under way to determine the extent and mechanism of the general reaction



M is a metal such as magnesium, zinc, or sodium (other reducing agents, such as iodide ion, may also function in the reaction); *X* is halogen; and *Y* is an electronegative group—e.g., halogen. The dotted line represents a multiple bond.

Earlier examples of Equation (1) include the reaction of zinc or magnesium with 1,4-dibromo-2-butenes to yield 1,3-butadienes (*1, 2*), and the reaction of γ-phenoxycrotyl bromide with magnesium to yield 1,3-butadiene (*1*). More recently, the authors reported the formation of butatriene in high yield from 1,4-dibromobutyne-2 and zinc in diethylene glycol diethyl ether (*3*). With zinc in ethanol or water, butatriene was formed in only small yield, the principal product being butadiene. An extensive study of the properties of unsubstituted cumulenes such as butatriene has been undertaken.

Other examples of the general reaction (*1*) have now been found. Thus, magnesium in tetrahydrofuran reacted with γ-bromocrotonaldehyde diethylacetal to yield 1-ethoxy-1,3-butadiene in 78% yield, and with γ-bromocrotonaldehyde diacetate to yield 1-acetoxy-1,3-butadiene in 60% yield. Ethyl ortho-γ-bromocrotonate and magnesium yielded a material which largely polymerized in the tetrahydrofuran solvent. Treatment of the reaction mixture with hot aqueous HCl gave a small yield of crotonic acid. This could have resulted from the expected product of the reaction with magnesium, 1,1-diethoxy-1,3-butadiene, by reaction of this ketene acetal with water to yield ethyl crotonate (or ethyl vinylacetate) and then hydrolysis to the acid.

Iodide ion perhaps can be substituted for the metal in the above elimination reactions. For example, potassium iodide in aqueous methanol converted 1,4-dibromo-butene-2 to butadiene-1,3, and 3,6-dibromocyclohexene to cyclohexadiene-1,3. That some degree of unsaturation in the carbon chain is required is shown by the fact that 1,4-dibromobutane failed to yield any ethylene when treated with magnesium.

Other examples on which the elimination reaction (1) will be tried include γ-chlorocrotonylchloride, γ-chloropropiolic acid chloride, fumaryl and maleic acid chloride, and acetylenedicarboxylic acid chloride. Perhaps the reaction also can be extended to six carbon analogs, such as the conversion of 1,6-dibromohexadiyne-2,4 to hexapentaene.

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Three- and Four-Dimensional Plotting

THE examination of experimental results by plotting a graph in two dimensions is almost universal, but little use is made of plots of variables in three dimensions. The lack of a suitable simple apparatus for plotting in three dimensions is one reason for the neglect of this potentially useful technique. In connection with a statistical analysis of data on acid, chloride, and volume for samples of gastric juice (R. B. Fisher and J. N. Hunt. *J. Physiol.*, **111**, 138 [1950]), a simple method of plotting in three, and even four, dimensions was worked out, and it may be of value to other workers with similar problems.

The apparatus shown in Fig. 1 consists of a cube of Lucite constructed of 20 numbered sheets of the same thickness locked together by two bolts and illuminated from below by a small electric bulb. The lowest sheet is ruled with a grid. To plot in 4 dimensions, two dimensions are represented by the position of points plotted in waterproof ink on the surface of the plates, the third dimension is represented by the number of the plate selected, and the fourth by the color of the ink used to plot the point. In practice,

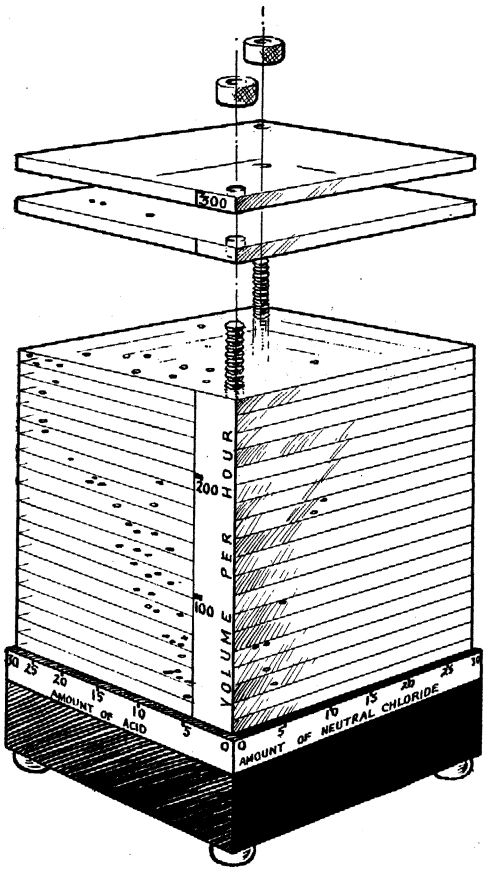

FIG. 1.

the data, previously classified, can be put into the block quickly and cleaned out again with alcohol when it is no longer required.

Inspection of data through the top face of the block allows a quick appreciation of the relationship between and among the variables and may suggest the type of statistical analysis to be used. The block also has value in demonstrating the meaning of three- and four-dimensional regression equations to those without formal statistical training.

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Unscientific Reporting

THE problem of getting accurate information to the public is frequently complicated by the changes and distortions of the newspapers. The following case history is an example.

In a telephone interview with a reporter of the Baltimore *Sun*, I stated that there are about as many cats as rats in Baltimore and, among other things, that cats eat few rats during a year. When the story appeared in the February 22, 1952, issue of the *Morning Sun* the headline read: SCIENTIST BLAMES LAZY CATS FOR CITY'S LAG IN RAT RACE. The story was picked up by other papers, and I received abusive letters or cards accusing me of being unfair to the rat-catching abilities of our feline friends. The latest (probably not the last) version appeared in the *New York Times Magazine* (April 6, 1952), as follows: "Dr. David E. Davis, Johns Hopkins School of Hygiene and Public Health: 'Baltimore cats are just plain lazy. If the cats would catch just one rat each, the city's rat problem would be solved'." Note that quotation marks were used around a reporter's version of a headline writer's version of a reporter's version of what I said over the telephone!

Fortunately in this case the distortion caused no bad consequences and did no harm. But how can accurate information be transmitted to the public without distortion? This amusing case history is trivial, but the problem of accuracy in transmisison must be solved.

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UPON reading the article "Reporting Science," by Frank Carey, in your April 18 issue, it occurred to me that at least three news items that appeared rather recently in the press as if they were very new indeed could have been "cut down to size" by the addition of background information easily obtained by a few telephone calls to local scientists.

The article in which the use of synthetic resins as a substitute for distillation in the purification of water should have included the information that the discovery, which was the subject of the item, was merely an improvement on rather old fundamental work.

The article on a new cancer cure (zinc chloride) would have been more enlightening had the information been added that the AMA listed this cure in the cancer section of *Nostrums and Quackery* at least thirty years ago.

The big news about seeding clouds with dry ice to initiate precipitation should have included the information that three airplanes had in 1930, in Holland, seeded clouds with solid carbon dioxide for the same purpose, and that the results at that time were said to be promising.

Supplementary material of this nature would have improved the articles or ruined them, depending upon the point of view.

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CONCERNING Baltimore's cats and rats, if the doctor was misquoted as he says, then there's NO excuse. It was just poor reporting by a man who would probably do a poor job on any kind of a story, science or otherwise.

I have no doubt that such things occur every now and then—and I made no claim in my article that every science story in the news is always accurate. I did point out that the men who are doing science day