merits of such a differentiation; such consideration, it is sad to say, does not lend too much weight to the claims of the former group. At this point, the writer wishes to mention that in all such discussion his arguments have been with the "exact scientists" in a general sort of way and that the following line of argument is based on a long period of work in the "exact" sciences (specifically, organic chemistry). The general examples to be cited are based on general practice in organic chemistry, which is, after all, a fairly representative branch of the natural sciences.

The science of organic chemistry is based essentially on a collection of observations which were made on the behavior of physical entities and agglomerations of these. The materials under observation must be regarded as statistical aggregates of a large number of molecules possessing a variable degree of identity, which is controllable to a certain degree by the manipulations entailed in the preparation of such aggregates. It must be conceded that any of the commonly used methods of purification and separation are essentially statistical methods, which cannot lead to the degree of isolation which can be used to justify the commonly-met statement: "pure compounds." Speaking in the sense of absolute logic I do not believe that anyone is justified in saying that this heap of crystals or that vial of liquid is a collection of identical molecules. There is no fractionating column in existence nor a crystallization technique nor any other physical or chemical method capable of absolute separation of materials in the course of an investigation. Whether one starts with the fundamental natural sources or buys the starting material as a "pure starting material" from a scientific supply house, the problem of separation is ever present. Now, the great bulk of work in the field is done with materials which are purified to the practicable extent and represent aggregates which show the gross variations of one unit or somewhat less in their most commonly used indices of purity: the melting point and the boiling point. Much of the technical work is done on materials with considerable extension of this range. Some work, essentially on standards, has been more exacting, but even here the justification for absolute identity of the aggregate is a matter of concern. Let us say, then, that the bulk of the organic chemistry is based on observations of compounds which are 99–99.8 per cent pure, with the emphasis being perhaps on the first figure. Even in the latter case a mole of such a compound will contain 1.2×10^{21} molecules of other substances which were either picked up en route during the manipulations or remaining from the initial starting material. Now, relatively speaking, this number is small; in the absolute sense it is a very large one. It must be conceded that the work in the field of catalysis shows at times spectacular effects produced by materials which are present in fractional per cent amounts in a given mixture; the effects of biological catalysts are at times even more pronounced. Therefore, is there a justification for the neglect of the presence of such large numbers of molecules as cited above in materials under study in so far as the chemical behavior is concerned? Of course, there is the practical justification which can be carried to the logical conclusion, which is that there is no physical apparatus possible (at least in our present state of knowledge) capable of absolute resolution of molecular aggregations. But this is just another way of saying that our "exact" science is not exact; that we do not really *know* that many reactions are or are not initiated by at least some of those miscellaneous molecules which are swarming in our "pure" compounds. These reactions need not be the spectacular ones induced by the well-known catalytic agencies, but merely the "everyday" classical reactions. We see the gross statistical effects only and have little or no true representation of the actual events.

Does not this seem to be similar to the criticisms leveled at the "social" scientists? Certainly, there is a striking parallel between the "materials" under study. As a matter of fact, the social sciences, especially in recent years, have devoted much time and effort in dealing with problems induced by relatively small fractions of national population. As an example, a well-known radical party which numbers some 50,000 members, *i.e.* some 0.03 per cent of our population, has had more words written about it by the "inexact" scientists than have been written by the "exact" organic chemists on the "missing" 1 per cent (or somewhat less) of their materials. On this basis, how much logical separation can we make between the two fields of work?

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Pandora's Box

The Army and the Navy appear to be determined to go ahead with experimental atomic bombing of naval vessels, despite the grave warnings by some physicists that any uncontrolled release of atomic energy might set off a chain reaction which would detonate the entire earth, and despite the fears of biologists concerning the possible effects of a subsurface explosion of an atomic bomb on marine life. The announced plans to carry out this experiment in the face of these warnings betrays a profound lack of understanding of the force which scientists have placed at the disposal of military men, and a regrettable paucity of imagination and lack of concern for other life on this planet. The chief concern of mankind should be the prevention of any further release of the atomic bomb: Hiroshima and Nagasaki are examples enough of its power, and adequate warning of the shape of things to come, and this unnecessary and dangerous experimental bombing should be abandoned before it is carried any further. Certainly its possible effects, in the light of our present inadequate knowledge, should be called to the attention of every one concerned in this scheme. War is out of date, and even admission of the possibility of future wars is welcoming the premature extinction of mankind. It is already far later than our military minds think it is.

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