SCIENCE

VOL. 97 FRIDAY, JANUARY 1, 1943 No. 2505

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

Lancaster, Pennsylvania

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

SCIENCE, COMMON SENSE AND DECENCY[1]

By Dr. IRVING LANGMUIR

ASSOCIATE DIRECTOR OF THE GENERAL ELECTRIC RESEARCH LABORATORIES

UP to the beginning of the present century one of the main goals of science was to discover natural laws. This was usually accomplished by making experiments under carefully controlled conditions and observing the results. Most experiments when repeated under identical conditions gave the same results.

The scientist, through his own experiments or from previous knowledge based on the work of others, usually developed some theory or explanation of the results of his experiments. In the beginning this might be a mere guess or hypothesis which he would proceed to test by new types of experiments. If a satisfactory theory is obtained which seems in accord with all the data and with other known facts, the solution or goal of the investigation was considered to have been reached.

A satisfactory theory should make possible the predictions of new relationships or the forecasting of the results of new experiments under different conditions. The usefulness of the theory lies just in its ability to predict the results of future experiments. The extraordinary accomplishments of the great mathematical physicists in applying Newton's Laws to the

[1] Address of the retiring president of the American Association for the Advancement of Science. Owing to the postponement of the New York meeting, at the request of the Office of Defense Transportation, the address was broadcast by Science Service over the Columbia Broadcasting System on December 26, 1942.

motions of the heavenly bodies gave scientists of more than a century ago the conviction that all natural phenomena were determined by accurate relations between cause and effect. If the positions, the velocities and the masses of the heavenly bodies were given it was possible to predict with nearly unlimited accuracy the position of the bodies at any future time. The idea of causation, or a necessary relation of cause and effect, has long been embedded in the minds of men. The recognized responsibility of the criminal for his acts, the belief of the value of education and thousands of words in our language all show how implicitly we believe in cause and effect. The teachings of classical science, that is, the science up to 1900, all seem to reinforce this idea of causation for all phenomena.

Philosophers, considering many fields other than science, were divided in their opinions. Many went so far as to believe that everything was absolutely fixed by the initial conditions of the universe and that free will or choice was impossible. Others thought that cause and effect relations were mere illusions.

From the viewpoint of the early classical scientist the proper field for science was unlimited. Given sufficient knowledge, all natural phenomena, even human affairs, could be predicted with certainty. Ampere, for example, stated that if he were given the positions and velocities of all the atoms in the universe it should be possible theoretically to determine the whole future history of the universe. Practically, of course, such predictions would be impossible because we could never hope to get the necessary knowledge nor the time to carry out such elaborate calculations.

A little later scientists developed the kinetic theory of gases according to which the molecules of a gas are moving with high velocity and are continually colliding with one another. They found that the behavior of gases could be understood only by considering the average motions of the individual molecules. The particular motion of a single molecule was of practically no importance. They were thus taught the value of statistical methods, like those which the insurance company now uses to calculate the probable number of its policy-holders that will die within a year.

The theories or explanations which were developed in connection with the natural laws usually involved a description in terms of some kind of a model. In general, instead of thinking of the whole complex world we select only a few elements which we think to be important and concentrate our minds on these. Thus, the chemist developed the atomic theory according to which matter was made up of atoms of as many different kinds as there are chemical elements. These were thought of as small spheres, but no thought was given as to the material of which they were made. When later theories indicated that these atoms were built up of electrons and positive nuclei this made very little difference to the chemist, for he had not needed previously to consider that aspect of the model.

High-school boys to-day are asked to build model airplanes. These must be of such shape that the different types of airplanes can be recognized when the profiles of the models are seen against a white background. It naturally is not particularly important just what kind of material is used in constructing them. Airplane designers build model airplanes to be studied in wind tunnels, but these do not need to be provided with motors.

Most of the models which the scientist uses are purely mental models. Thus, when Maxwell developed the electromagnetic theory by which he explained the properties of light he thought of a medium through which these waves traveled. This was called the ether. It was supposed to have properties like those of elastic solid bodies. The reason for this choice of a model was that at that time the average scientist had been taught in great detail the theory of elasticity of solid bodies. Thus the magnetic and electric fields could be understood in terms of the familiar elastic properties. At the present time relatively few students are well trained in the theories of elasticity. The situation is thus reversed and to-day we explain the properties of elastic solids in terms of the electrical forces acting between their atoms.

Every student of geometry constructs a mental model when he thinks of a triangle. The mathematical lines that bound the triangle are supposed to have no thickness. In other words, they are stripped of any properties except those that we wish particularly to consider.

Most of the laws of physics are stated in mathematical terms, but a mathematical equation itself is a kind of model. We establish or assume some correspondence between things that we measure and the symbols that are used in an equation, and then, after solving the equation so as to obtain a new relation, we see if we can establish a similar correspondence between the new relation and the experimental data obtained from the experiment. If we succeed in this we have demonstrated the power of the mathematical equation to predict events.

The essential characteristic of a model is that it shall resemble in certain desired features the situation that we are considering. On this basis we should recognize that practically any theory has many arbitrary features and has limitations and restrictions imposed by the simplifications that we have made in the development of the theory or the construction of our model.

Beginning with Einstein's relativity theory and Planck's quantum theory a revolution in physical thought has swept through science. Perhaps the most important aspect of this is that the scientist has ceased to believe that words or concepts can have any absolute meaning. He is not often concerned with questions of existence; he does not know what is the meaning of the question, "Does an atom really exist?" The definition of "atom" is only partly given in the dictionary. Its real meaning lies in the sum total of knowledge on this subject among scientists who have specialized in this field. No one has been authorized to make an exact definition. Furthermore, we can not be sure just what we mean even by the word "exist." Such questions are largely metaphysical and in general do not interest the modern scientist. Bridgman has pointed out that all concepts in science have value only in so far as they can be described in terms of operations or specifications. Thus it doesn't mean much to talk about length or time unless we agree upon the methods by which we are to measure length and time.

For many years, up to about 1930, the new physics based on the quantum theory seemed to be fundamentally irreconcilable with the classical physics of the previous century. Through the more recent development of the uncertainty principle, developed by Bohr and Heisenberg, this conflict has now disappeared. According to this principle it is fundamentally impossible to measure accurately both the velocity and the position of any single elementary particle. It would be possible to measure one or the other accurately but not both simultaneously. Thus it becomes impossible to predict with certainty the movement of a single particle. Therefore, Ampere's estimate of the scope of science has lost its basis.

According to the uncertainty principle, which is now thoroughly well established, the most that can be said about the future motion of any single atom or electron is that it has a definite probability of acting in any given way. Probability thus becomes a fundamental factor in every elementary process. By changing the conditions of the environment of a given atom, as, for example, by changing the force acting on it, we can change these probabilities. In many cases the probability can be made so great that a given result will be almost certain. But in many important cases the uncertainty becomes the dominating feature just as it is in the tossing of a coin.

The net result of the modern principles of physics has been to wipe out almost completely the dogma of causation.

How is it, then, that classical physics has led to such definite clean-cut laws? The simplest answer is that the classical physicist naturally chose as the subjects for his studies those fields which promised greatest success. The aim of the scientist in general was to discover natural laws. He therefore carried on his experiments in such a way as to find the natural laws, for that is what he was looking for. He was best able to accomplish this by working with phenomena which depended upon the behavior of enormous numbers of atoms rather than upon individual atoms. In this way the effects produced by individual atoms averaged out and became imperceptible. We have many familiar examples of this effect of averaging—the deaths of individual human beings can not usually be predicted, but the average death rate in any age group is found to come close to expectation.

Since the discovery of the electron and the quantum and methods of detecting or even counting individual atoms, it has been possible for scientists to undertake investigations of the behavior of single atoms. Here they have found unmistakable experimental evidence that these phenomena depend upon the laws of probability and that they are just as unpredictable in detail as the next throw of a coin. If, however, we were dealing with large numbers of such atoms the behavior of the whole group would be definitely determined by the probability of the individual occurrence and therefore would appear to be governed by laws of cause and effect.

Just as there are two types of physics, classical physics and quantum physics, which have for nearly twenty-five years seemed irreconcilable, just so must we recognize two types of natural phenomena. First, those in which the behavior of the system can be determined from the average behavior of its component parts and second, those in which a single discontinuous event (which may depend upon a single quantum change) becomes magnified in its effect so that the behavior of the whole aggregate does depend upon something that started from a small beginning. The first class of phenomena I want to call *convergent phenomena,* because all the fluctuating details of the individual atoms average out giving a result that converges to a definite state. The second class we may call *divergent phenomena,* where from a small beginning increasingly large effects are produced. In general then we may say that classical physics applies satisfactorily to convergent phenomena and that they conform well to the older ideas of cause and effect. The divergent phenomena on the other hand can best be understood on the basis of quantum theory of modern physics.

Let me give some illustrations of divergent phenomena. The wonderful cloud chamber experiments of C. T. R. Wilson show that a single high-speed electron or an alpha particle from an atom of radium, in passing through a gas, leaves a trail of ions. By having moisture in the gas and by causing the gas to expand just after these ions are produced, drops of water are made to condense on the ions. By a strong illumination it thus becomes possible to see or photograph this track of ions as a white line on a dark background. The time at which an alpha particle will be emitted from a radium atom is inherently unpredictable. It would be totally contrary to the teachings of modern physics to suppose that our inability to predict when such an event is merely due to our ignorance of the conditions surrounding the particular atom. The uncertainty principle requires that even if these conditions were absolutely fixed the time of emission and the direction of emission of the alpha particle are subject to the laws of chance and thus for a single particle are unpredictable.

The occurrences in the Wilson cloud chamber following the disintegration of a single radium atom are typical divergent phenomena. The single quantum event led to the production of countless thousands of water droplets and these made the track of the alpha particle visible and led to its reproduction in a photograph. This track may show some unusual feature of particular interest to the scientist; for example, it may have a kink which indicates that the alpha particle collided with the nucleus in one of the molecules of gas. The photograph may therefore be published —may start discussions among scientists that involve thousands of man hours—may delay one of them so that he misses a train on which he might otherwise have suffered a fatal accident. Examples of this kind, any number of which could be given, show that it is possible for single unpredictable quantum events to alter the course of human history.

The formation of crystals on cooling a liquid involves the formation of nuclei or crystallization centers that must originate from discrete, atomic phenomena. The spontaneous formation of these nuclei often depends upon chance.

At a camp at Lake George, in winter, I have often found that a pail of water is unfrozen in the morning after being in a room far below freezing, but it suddenly turns to slush upon being lifted from the floor.

Glycerine is commonly known as a viscous liquid, even at low temperatures. Yet if crystals are once formed they melt only at 64° F. If a minute crystal of this kind is introduced into pure glycerine at temperatures below 64° the entire liquid gradually solidifies.

During a whole winter in Schenectady I left several small bottles of glycerine outdoors and I kept the lower ends of test-tubes containing glycerine in liquid air for days, but in no case did crystals form.

My brother, A. C. Langmuir, visited a glycerine refinery in Canada which had operated for many years without ever having any experience with crystalline glycerine. But suddenly one winter, without exceptionally low temperatures, the pipes carrying the glycerine from one piece of apparatus to another froze up. The whole plant and even the dust on the ground became contaminated with nuclei and although any part of the plant could be temporarily freed from crystals by heating above 64° it was found that whenever the temperature anywhere fell below 64° crystals would begin forming. The whole plant had to be shut down for months until outdoor temperatures rose above 64°.

Here we have an example of an inherently unpredictable divergent phenomenon that profoundly affected human lives.

Every thunderstorm or tornado must start from a small beginning and at least the details of the irregular courses of such storms across the country would be modified by single quantum phenomena that acted during the initial stages. Yet small details such as the place where lightning strikes or damage occurs from a tornado may be important to a human being.

Much more obvious examples of divergent phenomena which affect human life are those involved in the mechanism of heredity and the origin of species. Whether the genes are inherited from the mother or from the father seems to be fundamentally a matter of chance, undoubtedly involving changes in single atoms. It is known definitely that changes in genes or mutations can be produced by x-rays, and it has even been proved that a single quantum is sufficient to bring about such an alteration. The growth of any animal from a single cell is a typical illustration of a divergent phenomenon. The origins of species and all evolutionary processes, involving as they do natural selection acting upon mutations, must depend at almost every stage upon phenomena which originate in single atoms.

An idea that develops in a human brain seems to have all the characteristics of divergent phenomena. All through our lives we are confronted with situations where we must make a choice and this choice may sometimes alter the whole future course of our lives. Occasionally such decisions are made by tossing a coin —an event which seems unpredictable—but there is no reason to doubt that single atomic processes, or small groups of them which follow statistical laws, may not often be a determining element.

When certain bacteria are heated until they begin to die it is found that in successive intervals of time the same fraction of the survivors succumb. This seems to prove that the life of these cells depends on a single unstable molecule whose change involves death. It is thus a matter of pure chance as to which particular individuals die within a given period.

The examples that I have given of convergent and of divergent phenomena are purposely chosen as extreme types. Actually there are many intermediate cases that are not clearly one or the other. Or, again, phenomena which start out to be divergent may apparently degenerate into the convergent type. For example, if the photograph of the Wilson cloud track did not prove to be of interest it would soon be forgotten and might have no further ascertainable effects on human lives. Similarly in the evolutionary process a new species that originates as a single divergent phenomenon may not survive and its effect soon seems to die out.

We must recognize, nevertheless, that a divergent phenomenon which once occurs permanently alters details of molecular arrangements in the convergent systems that follow it and thus conditions may be brought about which favor the occurrence of new divergent phenomena. In a world in which divergent or quantum phenomena occur we can thus have no absolute relation of cause and effect.

As the implications of the uncertainty principle, especially as applied to divergent phenomena, are more generally recognized the limitation of the idea of causality should have profound effects on our habits of thought. The science of logic itself is involved in these changes. Two of the fundamental postulates of logic are known as the law of uniformity of nature and the law of the excluded middle. The first of these laws is equivalent of the postulate of causality in nature. The second law is simply the familiar postulate that a given proposition must be either true or false. In the past these so-called laws have formed the basis of much of our reasoning. It seems to me, however, that they play no important part in the progress of modern science. The cause and effect postulate is only applicable to convergent phenomena. The second postulate in assuming that any proposition must be true or false implies that we attach absolute meanings to words or concepts. If concepts have meanings only in terms of the operations used to define them we can see that they are necessarily fuzzy. Take, for example, this statement, "Atoms are indestructible." Is this true or false? The answer depends upon what aspect of atoms is considered. To the chemist the statement is as true as it ever was. But a physicist, studying radioactive changes, recognized that some atoms undergo spontaneous disintegration or destruction. The fact is that the chemist and the physicist have no exact definitions of the word "atom" and they also do not know in any absolute sense what they mean by "indestructible."

Fortunately such questions no longer occupy much of the time of scientists, who are usually concerned with more concrete problems which they endeavor to treat in common-sense ways.

It is often thought by the layman, and many of those who are working in so-called social sciences, that the field of science should be unlimited, that reason should take the place of intuition, that realism should replace emotions and that morality is of value only so far as it can be justified by analytical reasoning.

Human affairs are characterized by a complexity of a far higher order than that encountered ordinarily in the field of science.

To avoid alternating periods of depression and prosperity economists propose to change our laws. They reason that such a change would eliminate the cause of the depressions. They endeavor to develop a science of economics by which sound solutions to such problems can be reached.

I believe the field of application of science in such problems is extremely limited. A scientist has to define his problem and usually has to bring about simplified conditions for his experiments which exclude undesired factors. So the economist has to invent an "economic man" who always does the thing expected of him. No two economists would agree exactly upon the characteristics of this hypothetical man and any conclusions drawn as to his behavior are of doubtful application to actual cases involving human beings. There is no logical scientific method for determining just how one can formulate such a problem or what factors one must exclude. It really comes down to a matter of common sense or good judgment. All too often wishful thinking determines the formulation of the problem. Thus, even if scientifically logical processes are applied to the problem, the results may have no greater validity than that of the good or bad judgment involved in the original assumptions.

Some of the difficulties involved in a scientific approach to economic problems is illustrated by the following: If we wish to analyze the cause of a depression (or for example, a war) we should ask ourselves what we mean by the word "cause" in this connection. In terms of operations the usual meaning of the word cause is something as follows: It is a common experience, in a study of convergent phenomena, that if a given set of physical conditions are brought about repeatedly at different times, the same result occurs in each case. Except in so far as it is possible to repeat the experiment and get the same result it is impossible to give a definite meaning to the word cause.

In the case of a depression or a war, we logically need to produce, or at least to observe, a given set of possible antecedent conditions and to see whether they are always followed by depressions. Since we can not produce experimental depressions, nor have we sufficient observational data to enable us by statistical means to unravel the enormous number of factors involved, we must conclude that the word "cause" as applied to a depression has an extremely fuzzy meaning.

When we consider the nature of human affairs it is to me obvious that divergent phenomena frequently play a role of vital importance. It is true that some of our historians cynically taught most of our college students from 1925 to 1938 that wars, the rise and fall of a nation, etc., were determined by nearly cosmic causes. They tried to show that economic pressure, and power politics on the part of England or France, etc., would have brought the same result whether or not Kaiser Wilhelm or Hitler or any other individual or group of individuals had or had not acted the way they did. Germany, facing the world in a realistic way, was proved, almost scientifically, to be justified in using ruthless methods—because of the energy and other characteristics of the German people they would necessarily acquire and should acquire a place in the sun greater than that of England, which was already inevitably on the downward path.

I can see no justification whatever for such teaching that science proves that general causes (convergent phenomena) dominate in human affairs over the results of individual action (divergent phenomena). It is true that it is not possible to prove one way or the other that human affairs are determined primarily by convergent phenomena. The very existence of divergent phenomena almost precludes the possibility of such proof.

The mistaken over-emphasis on convergent phenomena in human affairs and the reliance on so-called scientific methods have been responsible in large degree for much of the cynicism of the last few decades.

The philosophy which seems to have made the German people such willing aggressors is allegedly based upon scientific realism. Almost any system of morality or immorality could receive support from the writings of Nietzsche, so inconsistent are they with one another. But his teachings, which purport to be based on the laws of natural selection, have led in Germany to a glorification of brute strength, with the elimination of sympathy, love, toleration and all existing altruistic emotions.

Darwin, himself, however, recognized that the higher social, moral and spiritual developments of mankind were factors which aided in survival. This is often referred to loosely as the law of the survival of the fittest. The concept of fitness seems, however, inherently rather fuzzy. Apparently those individuals are fittest which possess characteristics that increase the probability that they shall survive.

We often hear realists deplore the effects of charity which tend to keep the unfit alive. We are even told that the whole course of evolution may be revised in this way. Similar arguments could be used against the surgeon who removes an appendix or a doctor who uses a sulfa drug to cure pneumonia.

But what is the need of developing a race immune to appendicitis or pneumonia if we possess means for preventing their ill effects. The characteristics that determine fitness merely change from those of immunity to those which determine whether a race is able to provide good medical treatment.

The coming victory of the United Nations will prove that survival of a nation may be prevented by an aggressive spirit, by a desire to conquer or enslave the world, or by intolerance, ruthlessness and cruelty. In fact, there is no scientific reason why decency and morality may not prove to be vastly more important factors in survival than brute strength.

In spite of the fact that we can no longer justify a belief in absolute causation and must recognize the great importance of divergent phenomena in human life we still have to deal with causes and effects. After all we must plan for the future. We can do this, however, by estimating probabilities even where we do not believe that definite results will inevitably follow. When our army lands in North Africa its probable success depends on the carefulness of the preparations and the quality of the strategy. But no amount of foresight can render success absolutely certain.

It does not seem to me that we need be discouraged if science is not capable of solving all problems even in the distant future. I see no objections to recognizing that the field of science is limited.

In the complicated situations of life we have to solve numerous problems and make many decisions. It is absurd to think that reason should be our guide in all cases. Reason is too slow and too difficult. We do not have the necessary data or we can not simplify our problem sufficiently to apply the methods of reasoning. What then must we do? Why not do what the human race always has done—use the abilities we have—use common sense, judgment and experience. We under-rate the importance of intuition.

In almost every scientific problem which I have succeeded in solving, even after those that have taken days or months of work, the final solution has come to my mind in a fraction of a second by a process which is not consciously one of reasoning. Such intuitive ideas are often wrong. The good must be weeded out from the bad—sometimes by common sense or judgment—other times by reasoning. The power of the human mind is far more remarkable than one ordinarily thinks. We can often size up a situation, or judge the character of a man by the expression of his face or by his acts in a way that would be quite impossible to describe in words.

People differ greatly in their ability to reach correct conclusions by such methods. Our numerous superstitions and the present popularity of astrology prove how often our minds make blunders. Since we have to live with our minds, we should train them, develop them, censor them—but let us not restrict them by trying to regulate our lives solely by science or by reason.

Our morality is a kind of summation of the wisdom and experience of our race. It comes to us largely by tradition or religion. Some people justify evil things on the basis of morality—but by and large a recognition of right and wrong, even if these concepts are sometimes fuzzy, has proved to be of value to mankind. The philosophical, metaphysical or even scientific analysis of the principles of ethics has not proved particularly fruitful. A sense of morality and decency, even if not scientific, may help win the war.

THE AMERICAN ETHNOLOGICAL SOCIETY[1]

By the late Dr. FRANZ BOAS

PROFESSOR EMERITUS OF ANTHROPOLOGY, COLUMBIA UNIVERSITY

THE American Ethnological Society was founded at a period when interest in racial and ethnic questions was very lively. The racial question was particularly a subject of heated discussion on account of the struggle between the abolitionists and the defendants of slavery. It had taken the form of a passionate controversy between those who stood for the unity of mankind and those who claimed distinct origins for the races of man. At the same time the interest in the customs and lives of alien people was very lively. It was about the time of the Wilkes expedition to the South Seas, of the vast collection of material on the American Indians by Schoolcraft and of intensive interest in the archeology of our continent.

Through the energy and interest of Albert Gallatin the American Ethnological Society was established and during the years from 1842 until his death in 1849 the society was a center of anthropological interest in New York City. About the same time the Government explorations of the western part of the United States gave strong stimulus to interest in the study of Indian tribes and of American antiquities. For a number of years the society contributed in important ways to our knowledge of both North and Central America. The investigations of members of the society were published in the form of Transactions, of which three volumes appeared, in 1845, 1848 and 1853. The last one of these volumes was never published because the whole edition was destroyed by fire before it was distributed. It was, however, republished in photographic reproduction in 1909 by the revived society. A new start was made in 1860 when the society began publication of a bulletin containing brief communications, the last of which appeared in 1869. The interest of members in the society was evidently declining rapidly and in 1869 a committee headed by E. George Squier issued a statement calling for reorganization on a new basis. The outlook of this group is characterized by the following statement issued in 1869, evidently drafted by Mr. Squier:

Statesmen, whether senators or kings, can no longer overlook the profound lessons inculcated by anthropology. The political reorganization of Europe is going on in consonance with its discoveries and results. Religion under its influence is separating itself from a ritualistic dogmatism that has nothing to do with morals or the relationship that exists between men and God and has become all the loftier from the dissociation.

To these grand results we may ask what has the American Ethnological Society contributed. Absolutely, for twenty years, nothing. True, ten of these years have been unfavorable to scientific pursuits in this country. Students having common sympathies and aims have been separated by political and social barriers and investigators weaned or diverted from their pursuits by imperative requirements in other fields. Estranged co-laborers, however, are returning with that catholic spirit which study for Truth inspires and encourages, to their old associations and researches; and the altered condition of our common country encourages and, indeed, makes necessary a wider and deeper investigation of the character and true relations of the varieties and races of mankind than ever existed before. But this investigation must be made *ab initio*, or rather in a purely abstract scientific sense. It can not be done by men who, for any reason or motive, bring into the study the element of faith, or adhesion to dogmas or creeds of any kind whatever. These subtle elements of depression of scientific inquiry have been, to a certain degree, the ruin of this Society. Your reporter can remember when the question of human unity could not be discussed without offense to some of the members of the Society and when its casual introduction was made a ground of impassioned protest. This allusion is made only to enforce the vital truth that, in scientific inquiry, the item of faith must be entirely eliminated. Not having been so, discussion in this Society has been relatively tame and fruitless.

On the basis of this critical examination of the activities of the society during the two decades from 1850 to 1869, the American Ethnological Society was dissolved and it was decided to reconstitute the society as the American Anthropological Society. Since at the same time an association with the same name had been founded in Boston, the committee followed the example of the newly consolidated Anthropological and Ethnological Societies of London and adopted the name "The Anthropological Institute of New

[1] Address delivered at the celebration of the centenary of the society, on November 14, 1942. Dr. Boas died on December 21.