

EVERY SCIENCE AN EXACT SCIENCE

BY VILHJALMUR STEFANSSON

It is said that Bacon considered all knowledge his province. But the sciences of today are so many and complex that a single Baconian view of them is no longer possible, and perversions of thought and action result because our intellectual horizon has been narrowed to a part of the field. From a realization of this have come various attempts to co-ordinate the sciences to permit a unifying view of the whole. The French philosopher, Comte, made one of these a century ago in his Positive Philosophy. There have been many since.

But if we pause to state clearly the case against the standardization of knowledge, the essential absurdity becomes so patent that we have to recall the numerous failures to convince ourselves that anyone was ever foolish enough even to try it.

Consider for instance the physiology of the human skin or the composition of a dust nebula. In these fields, among others, the accepted facts of a dozen years ago have become the error and folklore of today. You standardize knowledge, and while you are at the job the knowledge changes. Long before the thing can be adequately done it has ceased being worth doing at all.

Then why are we continually attempting this hopeless task? Partly, let us say, from irrepressible human optimism, which leads us to think that any desirable thing is possible. Partly, also, because of unclear analogizing from fields that seem related but are not. One of these analogies is from business. If you have on hand, on July 1st, a pair of socks, you will have them still on hand on August 1st, or else cash in your

till to correspond, assuming honest and successful management. But, in spite of unlimited honesty and efficiency, you have no guarantee that an idea on hand on July 1st may not have been simply removed by August 1st without any equivalent remaining on hand. You may have discovered that month, for instance, reasonable assurance that the moon is *not* made of green cheese, without being able to get any clear idea as to what it *is* made of.

The reader may here jump at the conclusion that we are arriving at a philosophy of pessimistic hopelessness. That is not the way of the true philosopher. His ideal is the *tabula rasa*. He sweeps away the systems of others, that he may build his own on a smooth foundation.

Realizing simultaneously the insatiable craving of the human mind for order and the impossibility of bringing order into the chaos of knowledge, we appear to be faced with a dilemma no less distressing than insoluble. But on looking deeper we find the dilemma apparent only. This will become clear when we consider the essential nature of knowledge.

The thoughtless among us may speak, for instance, of a red cow, and naïvely imagine we could prove our point with the testimony of a witness or two. But the philosophers have long ago made it clear that a cow would not be red but for the presence of someone to whom it looks red. Having established that point, the deeper of the philosophers go on to prove that the cow would not only not be red, but would not even exist, were it not for the presence of someone who thinks he sees a cow. In our argument the position is even

stronger than this, for we have two lines of defense. First, we agree with the philosopher that you cannot prove of any given cow that it is red, or even that it exists at all; secondly, we insist that an idea is so much less stable than a cow that even were the philosophers wrong about the cow not being red they might easily be right about an idea not being right, or not existing. Take an example. The philosophers of the Middle Ages demonstrated both that the earth did not exist and also that it was flat. Today they are still arguing about whether the world exists, but they no longer dispute about whether it is flat. This shows the greater lasting power of a real thing (whether it exists or not, for that point has not yet been settled) as compared with an idea, which may not only not exist but may also be wrong even if it does exist.

II

We have now come in our discussion to the point where we see the absurdity of supposing ourselves to have any knowledge, as knowledge is ordinarily defined—or at least we would have come to that point but for lack of space which prevents us from making the subject really clear. However, it doesn't matter from a practical point of view whether you have followed this philosophical reasoning. Perhaps you are not a philosopher. In that case, and in the homely phrase of the day, I ask you, what's the good of an Englishman's learning first that all Americans speak through their noses and secondly why they do so, when he has to find out eventually that they do not? What's the good, again, of knowing that central Australia is a desert and that certain principles of physiography make it so, when you may have to listen to an afterdinner speech by some scientific traveler telling that it is not a desert?

Such things do not always go in triplets of (1) so it is, (2) why it is, and (3) it is not—but that is a common order.

The reader may here protest that we are not getting much nearer our promised emancipation from the dilemma between our passion for system and the impossibility of systematizing knowledge. We have hinted above that the solution lies in finding a new basis for knowledge, and this we now proceed to do.

So long as you believe in them, the nasality of American speech, and the desert nature of central Australia are fragments of knowledge capable of being arranged in a system. The trouble comes when you find them out, as it were—discover that they are "untrue." This gives the solution of our problem. We must have knowledge that is incapable of being contradicted. On first thought this seems impossible, but on second thought we realize that such facts do exist in the domain of mathematics. Two and two make four.

But why do two and two make four? Obviously because we have agreed that four is the name for the sum of two and two. That principle has been applied in mathematics to such advantage that it is rightly called the science of sciences, and this is the principle which, now at length, we propose to apply to all knowledge. Through it every science will become a pure science and all knowledge as open to systematization as mathematics.

The trouble with all facts outside the field of mathematics has been inherent in the method of gathering information. We call these methods *observation* and *experiment*, and have even been proud of them—not realizing their clumsy nature, the unreliability of the findings, the transient character of the best of them, and the essential hopelessness of classifying the results and thus gratifying the passion of the human intellect for order and symmetry in the universe.

Take an example. A man comes from out-of-doors with the report that there is a red cow in the front yard. Neglecting for the moment the philosophical aspect of the case—as to whether the cow would be red if there were no one to whom she

seemed red, and also the more fundamental problem of whether there would have been any cow at all if no one had gone out to look—neglecting, as I say, the deeper aspects of the case, we are confronted with numerous other sources of error. The observer may have confused the sex of the animal. Perhaps it was an ox. Or if not the sex, the age may have been misjudged, and it may have been a heifer. The man may have been color-blind, and the cow (wholly apart from the philosophical aspect) may not have been red. And even if it was a red cow, the dog may have seen her the instant our observer turned his back, and by the time he told us she was in the front yard, she may in reality have been vanishing in a cloud of dust down the road.

The trouble lies evidently in our clumsy system of observing and reporting. This difficulty has been obviated in the science of mathematics. A square is, not by observation but by definition, a four-sided figure with equal sides and equal angles. No one has denied that and no one can, for the simple reason that we have all agreed in advance that we will never deny it. Nay more, we have agreed that if anyone says that a square has three or five sides we will all reply in chorus: "If it has three or five sides it is not a square!" That disposes of the matter forever.

Why not agree similarly on the attributes of a front yard?—making it true by definition that, among other things, it contains a red cow. Then if anyone asserts, for reasons of philosophy, color-blindness or the officiousness of dogs, that there is no red cow in the yard, we can reply, as in the case of the squares, "If it does not contain a red cow, it is not a front yard!"

III

The author feels at this point a doubtless unwarranted concern that he is not being taken seriously. Or perhaps the plan proposed is not considered practical. But the proof of the pudding is in the eating. The

thing has been tried, and successfully—not in the systematic way now proposed, but sporadically. Some instances are well known and convincing.

Take the assertion that a Christian is a good man. If you attempt to deny this on the ground that Jones, a deacon in the church, ran off with some public funds, your stricture is at once shown to have been absurd by the simple reply: "If Jones was a thief, he was *not* a Christian." A Christian is, not by observation but by definition, a good man; if you prove that a certain man was not good you merely show that he was not a Christian. Thus we have established once and forever the fact that a Christian is a good man. It is like a square having four sides.

But if someone asserts that a Bolshevik, a Republican or a chemist is a good man, you can soon confute him; for the members of these classes have neglected to define themselves as good. Thus their attributes have to be determined by observation and experiment (after you have first run the gauntlet of the philosophers who ask whether the Bolsheviks could be good without the presence of someone who considers them good, and further whether any Bolsheviks would exist at all but for certain people who think they exist). It is highly probable that evidence could be brought against almost any given Bolshevik and even some Republicans to show that they are not good men. At any rate we have here no such clarity of issue as in things that are true by definition—as the four-sidedness of a square or the goodness of a Christian.

Through some experience of arguing this case in the abstract I have learned that its essential reasonableness can best be established from concrete examples. Let us, then, take cases at random from various fields of knowledge.

Consider first the ostriches of Africa. These birds have been studied in the wild by sportsmen and zoölogists, and as domestic animals by husbandmen who tend them in flocks like sheep. There are accord-

ingly thousands of printed pages in our libraries giving what purports to be information upon their habits. Besides being indefinite and in many ways otherwise faulty, this alleged information is in part contradictory.

Having studied the bird of Africa, let us turn next to the ostrich of literature, philosophy and morals. Instead of the confusion in the case of the ostrich of zoölogy, we have clarity and precision. This is because the ostrich of literature exists by definition only. He is a bird that hides his head when frightened. You may too precipitately object that men would not accept universally this definition of the ostrich of literature if it did not fit also the zoölogical ostrich. The answer is that the definition has never received any support from zoölogists, hunters or the owners of the domesticated birds and yet it has been accepted universally throughout Europe since Pliny's time (about 50 B. C.). It has survived all attacks from science and from the bigoted common-sense of those who did not recognize its true nature. Like the definition of a four-sided square or a good Christian, it has survived because it was useful. Can you imagine any real attribute more instructive than the head-burying of the ostrich-by-definition? As a text for moralists, as an epithet that politicians use for their opponents, as a figure of speech generally, what could serve as well? Our literature is richer, our vocabulary more picturesque through this beneficent bird of hypothesis. He has many inherent advantages that no real bird could have. Since his habits are defined we need not waste time studying him first hand nor in trying to adjudicate at second hand between books about him that disagree. Since he never existed as a beast he is in no danger of the extinction that is said to threaten the lion and swan.

Consider next what trouble we should get into if we did not have the literary ostrich and wanted to convey picturesquely the idea of that sort of wilful blindness from which we ourselves never suffer, but

which curiously afflicts our opponents. In pursuit of suitable analogy we might vainly canvass the whole animal kingdom. The ostrich-by-definition is, therefore, not only less trouble to deal with than a real bird; he is actually more useful and instructive than any real bird or beast. When we consider how often he has been used in sermon and precept we must admit that this model creature has contributed substantially not only to the entertainment and instruction of nations, but also to the morality and general goodness of the world.

The ostrich is but one of several useful birds of definition. But we must be careful not to confuse these with real birds or their value is lessened. An example is the stork that brings babies. By a confusion of thought which identifies this stork with real storks, and through the pernicious birth-control propaganda which insists on rationalizing everything, this stork has ceased to be useful except in conversation with children, in the symbolism of the movie, and in the picture post-card industry.

The wolves of literature are among the most picturesque and useful of our definitions. Zoölogical wolves go in pairs or families, never above a dozen. It is obvious how inadequate this would be for modern movie purposes, where they should run in packs of scores or hundreds. Even in a novel or short story of Siberia or Canada you need packs large enough for the hero to kill fifteen or twenty, with enough left over to eat, or to be about to eat, his sweetheart. This is easily accomplished by employing a wolf of the general type we advocate—having no relation to the so-called realities but possessing by definition all the required characteristics (habit of running in packs of any desired size, willingness to eat, or attempt to eat, the heroine, etc.).

Another useful definition has long been that of Arctic, Canadian and Siberian cold. The danger and disadvantage of confusing this hypothetical with a so-called real

climate are best seen if we compare the facility with which people who have never been in these countries use the weather in conversation, speeches and books, and contrast that facility with the awkwardness of travelers and natives. An example is a story by Tolstoi. Great as he was, he failed to realize the advantage in simplicity and vividness of postulating that Siberia is always cold, and actually allowed himself to be led into the artistic blunder of having the convicts in one of his novels die of sunstroke. An acquaintance of mine was filming this story. He realized the pictorial ease of "putting over" drifting snow as compared with heat waves—the snow could be managed with confetti and an aeroplane propeller, but how would one photograph heat waves? But he realized still more clearly that the public is wedded to the defined, as opposed to the "real," climate of Siberia and did what Tolstoi would have done in the first place had he lived in London—changed the scene from Summer to Winter and then froze to death as many convicts as the picture required.

IV

These few examples from among many will suffice to show not only that the method of knowledge-by-definition is and long has been in standard use, but also that it has the advantages of being easily grasped, picturesque and of a higher average moral value than the so-called "real" knowledge. It is inherent in the genesis and nature of defined facts that they can be made picturesque in proportion to the ingenuity of the one who defines them, and as moral as that one desires. This is a striking advantage over empirical knowledge, which cannot always be relied on to support the fashion of the time or even the moral system of the community. It is from this last point of view that there has grown up in many countries of recent years a profound distrust of "facts" and the theories deduced from them. In En-

gland they are dealt with by the simple and adequate way of paying little attention to the exposition of "new" things. In the United States it has been found that the public listens even to the newest views, and sometimes actually wants to act upon them. This has necessitated the expedient of passing laws prescribing what may and may not be advocated and believed. These laws are a step in the right direction, but inadequate because they do not have back of them any but specific moral considerations. Few people as yet realize the general reasons of expediency and broad sanity that lie back of the scheme we are here proposing.

Let us consider next a sample or two of knowledge-by-definition that could well be added to our present stock. Just as artificial tongues are built upon spoken tongues but avoid their mistakes, so may we conveniently base our knowledge-by-definition, or absolute knowledge, on what is already believed by some. Assume, for instance, that all Irishmen are peasants holding land by insecure tenure from grasping landlords, that each has a pig under his bed, that everyone carries shillalahs, that kissing the blarney stone is the chief national occupation. Having agreed on these things, we could teach them in the schools of all countries. We should then presently all agree (on the basis of common facts) as to what our attitude toward Ireland should be and the troublesome Irish Question would disappear from politics and history. Think, too, what a charm the new system would lend to travel in Ireland! So soon as you landed you would note the rarity or absence of all the things you had expected. You would meet surprise after surprise, which would not only delight you at the time but would give you material for endless letters home and for endless stories to tell when you got back. Thus would be built up an increasing tourist traffic, a source of revenue to Ireland itself and to the shipping and tourist companies of the various nations.

You may think such tourists, on coming home, would upset our system of facts-by-definition about Ireland. Not if that system is once thoroughly established. Consider in that relation the Greek pronouncement that at any time of year it becomes colder the farther North you go. North America is in language and civilization a homogeneous country in which one might think knowledge would therefore spread rapidly, and in which Atlanta, Richmond, New York and Montreal are and have been for a century large and well-known cities that are by observation about equally hot in July. Yet there is even today practically unanimous adherence in all these cities to the Greek definition ("the farther North the colder at any time of year") and each city believes those farther South to be hotter and those farther North to be colder, though thousands of travelers for a hundred years have found it to be uniformly otherwise. The ostrich with his head in the sand has survived two thousand years and is still going strong. No human being can retain oil, but the hypothetical Eskimo drinks it by the flagon in our books and belief and is none the worse for it. Then why should not all the world forever believe that every

Irishman has a pig under his bed? All parties would benefit. It would be only the hypothetical Irishman that has the pig and we could by hypothesis arrange that he should thoroughly enjoy it. The real Irishman would get the benefit of the increased tourist trade and surely he ought to be grateful. The tourist would make facile discovery of the non-existence of the pig; that would please him and interest all his friends forever after as a sort of occult knowledge, like knowing privately that Indian fakirs are really no more clever than our conjurers, a pleasing secret now possessed and highly valued by many without detriment to the fakirs or to those who prefer to say they have seen them do marvels. Thus would everyone be the gainer.

V

It is obvious we could proceed along these lines to the development of a whole new system of thought and education. But we pause satisfied with having presented the germ of the idea. Once the point of view is attained, we feel sure the plan will develop in the reader's mind into a coherent philosophy helpful in solving the most difficult problems.

THE TWO TAFTS

BY CHARLES WILLIS THOMPSON

We have two Tafts, dear,
Two, and yet the same.—ROBERT BUCHANAN
forty years later.

IF WE hadn't, there would be no amiable Chief Justice expanding under the glow of newspaper approval, or, at worst, no more derided than other members of the Federal bench; there would be only the blundering politician who was hurled out of office by the greatest revolt his party had ever known, one that must have consoled the souls of Grant and even Blaine. The queer thing is that all his life Taft had wanted to be a judge, not a politician. Well, circumstances, in the form of Republican votes, as he himself would say, for he has a sense of humor and is honest with himself, decided that his ambition should be fulfilled at last, and there he is on the bench. If ever, on dull days, he hankers secretly for the fleshpots of politics, then he blunders again, for in politics Taft was ever all thumbs.

Taft the blunderer! It seems a strange epitaph for a President and Chief Justice of the United States; yet it is true, at least, of the politician and tells the story of his fall. The energy in him, that made him survive it, was of the judicial kind—and let no man doubt that there *is* judicial energy! Judicial history, in fact, is full of fists pounded on the table, including the Taft fist, which struck a table on the other side of which sat Medill McCormick. In nearly every case the pounding was a blunder, and meant the oversetting of the court, the judge, or, in the long run, the nation; but it must be observed that in the Taft-McCormick case the blow fell after Taft had left the bench and before he re-

turned to it. Therefore, as a blunder, it belongs, like all Taft's blunders, to the political phase of him, not to the judicial. It was merely another proof of his essential sagacity when he used to say, "It's good of you, Theodore, but I'd rather be a judge." It would be going too far, perhaps, to say that that fist-pounding in 1909 turned the Middle West into the Democratic column in 1910 and elected Wilson in 1912, because no one thing did that; but the blunder which it symbolized did the trick, and more too. For example, it set Hiram Johnson at Coolidge's heels to-day.

In the era of his historic blunders Secretary and President Taft was a fat man; to-day, treading the primrose majority path of the Supreme Court he is only the size of every tall man. There was always something that gave promise of that reduction. He was never gross, even when he weighed three hundred pounds. He was always light on his feet; he liked to dance, and the girls said with surprise that he was a lovely waltzer; you did not hear the sound of his coming, as you did the sound of Billy Mason's. His pet amusement was skipping around the country in automobiles and Pullmans and off it in ships. Now he is no longer fat—not nearly so fat, indeed, as most other men of his height. But since Error dies only gradually, paragraphs and editorial writers will go on until the end of time, or of Taft, describing him as a second Daniel Lambert, just as they used to ascribe Roosevelt's misdeeds to the enthusiasm of youth long after he had joined, as he phrased it, the grandfather class.