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## **The Relation of Chance to Purpose in Invention**

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In my last paper I reached the conclusion that it is through purpose that novelty is brought about. I propose in this paper to attach that doctrine. It will be purged and strengthened by a hand to hand encounter with its principal adversaries. I have called this paper the Relation of Chance to Purpose in Invention. I will define the three important words, in the title. In defining invention I assume without discussion both that there is nothing absolutely the same twice and nothing absolutely disconnected from the past. What we mean by invention must be, therefore, a relatively significant variation. We also have to distinguish between what is an invention for the individual who creates it and what is really new to society. In this paper I shall use invention as anything new and relatively valuable to the individual who works it out. I shall develop later the conception of chance. Here I will give simply its definition. Chance is the encounter of factors outside of our plans with our special end.

Next it is important to define what I mean by Purpose. There is a subtle temptation to make purpose an all embracing term. It is thoroughly obliging and at a moments notice will stretch to include the activities of jelly-fish and bacteria, or at a pinch, take under its protecting wing the vaguest emotions which may chance years later to evolve into a plan.

Now just because purpose is an idea of central importance, it is best to keep its meaning from stretching so thin that it becomes a mere veil, a haze blurring our view of reality.

I know, of course, that there is and can be no fixed moment in the growth of an individual at which purpose begins and that it is rooted in what is less definite, but to keep myself to a standard of clearness, I shall say that an individual has a purpose when he has a deliberate plan of action. Here at once I am plunged into the midst of my discussion. There ware within the idea of purpose as thus defined two distinguishable but inseparable aspects, that of discriminating or reflective attention and that of motor activity wherein the ideas to which we attend are manifested. These aspects may be briefly called thought or will. If it can be shown that the new does not and cannot be formed by either of these aspect thought or will, we shall have overthrown the claim of purpose to be the sufficient source of novelty.

(a) The relation of thought and novelty is very ably stated in a book by Souriau on the theory of invention and as I agree with his statement, though not wholly with his conclusion, I shall use several of his illustrations. Souriau begins by asking whether invention can be the product of deliberation and answers, that though it is true that we bring to every new problem a certain fund of thought, yet the really new is precisely what is never explained by thought, for if we already knew what we were to do or to make, it would not be original. Examples of this may be found anywhere in art. The poet who knows beforehand precisely what he has to say will not write a truly original poem. To succeed in being original, he must be open to chance suggestions; for instance from the rhyme. The poet chooses a word for the ending of his first line; the choice of this first ending brings up a limited number of words which rhyme with it, and these accidents of language themselves suggest to the poet a new idea and mold his conception. So the original orator is not he who plans every word and inflection of his speech at home, but he who is moved by the audience, moved by every chance incident in the meeting, moved even by the unexpected associations which his own words called up. We often speak of our end as if it were like a

distant mountain top visible through all our walk and definitely the same all along. But any end which involves invention is changed in to process of fulfillment, otherwise it simply repeats our past idea or that of someone else. Hence the new cannot be the product of thought.

But though the function of thought is not to create, its value is still two fold. First, to hasten discovery by increasing the number of our ideas and so the chance of forming a good one, and second, to restrain our ideas from wandering out of the field and to persuade us to retreat resolutely from blind alleys. Even the sterile critic is of value in this respect. He creates nothing, but by his persistent condemnation he tends to clear away rubbish and to lead the artist to discriminate between what is valuable and what is worthless. He never shows where the road to discovery is, but by his reiterated cry “you are off the path,” he gives us a general restraint that is of value. Thus the function of thought is mainly negative. It restrains us within a limited area, it rejects absurdities, but for this very reason it is too conservative to create. Novelty is found by one who roves the world, not by one who stays always at home.

(b) Relation of Will to Novelty.

Souriau’s position that invention cannot be a product of thought is strengthened by the development of the thesis that the new cannot be willed in Prof. Royce’s article on originality and consciousness (Studies of Good and Evil, p. 249).

The wish and intention to be original defeats itself and results in waywardness or in self imitation. “Originality must in general belong to the unconscious side of our life.”

It cannot be due to will for I cannot will to do anything until I know what I am to do and I can only know by having done the act before. The initial act of the series must have been involuntary. So in learning to swim I cannot will to swim, I can only put myself in

deep water and gasp and struggle until unconsciously and after a while I find the right combination of movements. “We imagine the will to be originative merely because very often by repeating old deeds we can get ourselves into unheard of situations, but it is life in such cases that contains novelties, it is not we who are original.”

### Originality and Chance

Now if invention is not due to deliberation or to will, if it can not be a product of intention on our part, it must be the result of what is beyond our plan, that is, of what turns up as far as we are concerned by chance. The question at once arises what is chance? In the first place it does not involve lawlessness. All effects in nature however complicated, have causes and hence there is no chance in the outer world. Again all human actions are determined by ends and there is no chance in the world of men though here, as in any complicated natural event, the difficulty of tracing intricate relations may give the appearance of lack of motive or cause. A man may, for example, be undecided what course to take because his desire for success struggles for his desire for honesty, but this, while it confuses the issue, does not any more tend to show that he acts without motives than the wind which blows the falling leaves upward tend to disprove the law of gravitation. There is no accident either in world of nature or of thought, but what we call chance is always the encounter of factors of which our plans are unaware with out own end. For example, a ship is sunk by a glacier, the glacier is moved by wind and currents, the ship is steered in relation to the captain’s purpose, with a full knowledge of the movements of these two bodies. The collision would have been seen to have been inevitable. Nevertheless, it was wholly outside of the plans of the captain and so seems to him accidental. A card player by chance turns up an ace. It is chance to him, although made inevitable by the shuffling and cutting of the cards. So again the case of a brick badly cemented and loosened by rain, which hits a man

on his way to the office. The idea of chance as something without cause is illusory. But our perpetual ignorance, both of external events and of the full meaning of our own plans, makes what appears as chance a necessary and permanent factor in experience.

Now that we have established the powerlessness of thought or will to originate and have defined chance as the unforeseen factor which surprises our purpose, the ground is cleared for the discussion of the way in which chance brings novelty. Hints and signs of something beyond purpose were everywhere emerging in my paper on novelty, though I tended to suppress them there as unwelcome intruders who would injure my plan. Now that my purpose is broadened through the persistent self-assertion of these chance factors, they shall have their innings. I shall take up further aspects of the power not ourselves which makes invention and try to show first, that chance actually does enter into our purposes and second, that when we rigidly exclude chance, originality dies.

- A. There is always chance in the birth of purpose.
  - (a) Either through the allurements of sight and sound, or
  - (b) Through the pressure of need.

In either case if we exclude chance, originality dies.

- B. Purpose is always changed in the process of fulfillment by the chances which meet it.
  - (a) Every plan we form is vague and
  - (b) Ought to be vague for without chance suggestions we repeat.

(a) The earliest dawnings of creative work appear in children associated with a marked element of chance. A little boy finds a piece of chain and more or less unconsciously balances it over a level bar. As his hands play with it he notices that one end goes up as the other goes down. The pulley idea is recalled and he looks about vaguely for

something to attach to his hook. His luncheon basket is in sight and he eagerly seizes it, but now he needs a weight for the other end and some means of attachment. He thinks of a stone and runs out in the street to find one, and unable to find twine remembers or devises the powers of a handkerchief. Then he proceeds to what is for him the relatively original invention of an elevator.

In the analysis of this case we see (1) It was chance plus a greater interest in chains than e.g. in Latin grammar that made him see the chain. It was accidental groping which led him to balance the chain on the bar. It was imitation which suggested the construction of a pulley and the purpose of making an elevator arose rather as a result than a cause of activity.

Even in far more mature natures the birth of a purpose is a dark spot in which chance plays a large part. Charles Darwin was nearly dissuaded from taking the voyage in the *Beagle* (the critical event of his life which he spoke of later as his second birth), - because his father thought it would appear disreputable that one who was to be a clergyman should be associated with roving explorers and rowdy sailors. Chance brought in his path friends who overcame his father's opposition, but even after the important decision to take the voyage was made, the birth of the definite place to trace the origin of species was due to an influx of chaotic facts (e.g. the myriad specimens drawn up by chance from the deep sea), rather than solely to a fixed intention.

Is not this typical and characteristic? Is not the starting point of invention the imperfect, the chaotic, the disorderly rather than the exclusively deliberate and definite? "The little beggars are doing just what I don't want them to," Darwin would say of his seedlings, but it was just because they would not conform to theory that they led him to really original work.

In artistic work the dawning of a plan seems often due to chance elements. An Indian box with dancing figures inscribed on it suggested to Massenet the ballet of his *King of*

Lahore. The duel scene in Adam Bede jumped into George Eliot's mind one night at the theatre.

In short, as Stevenson says, "The world is so full of a number of things I am sure that we all should be happy as kings," and not only happy, but inventive. Lift up your eyes anywhere and something suggestive seems almost sure to hit you, unless you are protected by the armour of \_\_\_\_\_. We take the credit but the impetus and suggestion is forever flowing in from an endless, dazzling flight of objects of beauty or curiosity.

On the other hand when we exclude all chance elements from the birth of our purpose, we are decidedly apt not to get novelty at all. The sense that the deliberate watching of the birth of novelty kills it has wrought itself into the proverb, "A watched pot never boils." An element of mystery and even of unconsciousness hangs over the moment of creation.

"A man will not be observed in doing what he can do best. There is a certain magic about his prosperest action, which stullifies your power of observation. Every man is an impossibility till he is born, everything is impossible till we see a success." Emerson, Experience III, 70.

The fact that roots grow only in the dark and that seeds must be buried has wider applications than in the realm of horticulture. It is most often out of the dark of unconsciousness that the greatest thoughts grow and the poems written for occasions and the deliberately commemorative pictures are usually the least original.

There is something like the swift movement of a juggler's hand and while we watch it a marvel has taken place not where we looked, but elsewhere. This does not seem accidental, but necessary; when we clearly foresee and perceive we simply unroll the old instead of evolving the really new.

“Power (says Emerson, Experience, p. 69) keeps quite another road than the turnpikes of choice and will, namely, the subterranean and invisible tunnels and channels of life... Nature hates calculators, our chief experiences have been casual.”

Hence a certain loosening of purpose and “abandon” is essential to originality. This is what Stevenson pleads for in the Apology for Idlers. (*Virginibus Puerisque*, p. 124).

“Look at your industrious fellows. They have no curiosity, they cannot give themselves over to random provocation.....When they do not require to go to the office.....the whole breathing world is a blank to them.

Many who have plied their book diligently come out of the study with an ancient and owl-like demeanor and prove dry, stockfish and dyspeptic in all the brighter parts of life.

I have attended a good many lectures in my time. I still remember that Emphyteusis is not a disease nor Stillide a crime. But though I would not willingly part with such scraps of science, I do not set the same store by them as by certain other odds and ends that I came by when playing truant.....He may pitch on some tuft of lilacs over a burn.....and there he may fall into a vein of kindly thought and see things in a new perspective.....While others are filling their memory with a lumber of words, your truant may learn some really useful art.

In many of the examples I studied in my last paper on creation the element of need was prominent as a factor in creation and need is the pressure of something beyond himself on a man.

I touched on this doctrine of need in the account of the re-invention by school-children of a loom to weave a rug, in the doctrine of Political Economy that demand creates supply; in the hunger for expression which impels the artist, in the attitude of missionary who looks only for that place where he is most needed. It is proverbial that Necessity is the mother of invention, and it expresses a profound truth and brings out the fact that all our well-laid

schemes are less effective in forcing us to originality than the pressure of stringent circumstances. The tramp who has had no breakfast is surprisingly ingenious and original in his plans for wheedling a dinner out of a good natured cook, the man whose shoes wear out in the Labrador wilderness becomes as inventive in mending or supplementing them as is Edison. The word need has various usages and yet it is interesting to find that in all of the various implications we may say with truth that it is need rather than a deliberate intention which creates. Need is necessity and necessity (a constraining difficulty) is the extreme pressure of circumstances rather than a chosen plan. But again, need is a want, a nothingness, an aching void and out of the ache and void rather than out of the fullness of content, the satisfaction of a clear purpose the new life seems most normally to break its way. It is what we have not formulated rather than what we have that compels the new act.

Human nature abhors a vacuum and the sense of void calls forth latent powers. On a higher plane we find that the greatest men of genius and power are not satisfied to state their success in terms of their own will or purpose and appeal to need as almost necessity.

Luther exclaims;- “Here stand I; God help me, I cannot do otherwise.” Lowell (Poems 57) makes Columbus say “For me I have no choice.....Here am I for what end God knows, not I. Westward still points the inexorable Soul.....A hand is stretched to him from out the dark, which grasping without question he is led, where there is work which he must do for God.” (If the will of God constrains me).

It is this I suppose which is the underlying truth in Butschli’s mechanisms and vitalisms statement that the artist who makes the Parthenon is least of all his own designer. “Himself from God he could not free,” and thus it was that he built better than he knew and that Nature gladly gave his temple place. The passive master lent his hand to the vast soul that o’er him planned.”

B. So far I have spoken of the chance factors which entered into the birth of a purpose, but it is even more striking to find how after its deliberate start in life a purpose is molded by what it meets on the road. This is due primarily to the fact that every idea or plan we form is vague, it is a frame ready to hold a thousand different pictures. When, e.g., we speak of the sky as blue, this word blue still leaves open as possibilities an indefinite number of shades; when I say "I am going to move my arm to the left", even such a relatively definite statement admits within its scope scores of different motions of varying rate. In our most concrete plans we never foresee all the possibilities. The prudent surgeon knows that he must do his thinking ahead of the operation; he must face beforehand all the emergencies which may come up and make his decision how to meet each one. But with the best intentions he never succeeds, the situation is always different, unexpected, new; to meet it he has got to be inventive in some respect. This looseness or indefiniteness of any plan which might be considered a lack, is the centre of radiating opportunity. Each step in the fulfillment of a purpose suggests a partially new plan to the open eyed.

Prof. Baldwin gives a delightful illustration of the effect of chance suggestion which changes and brings originality to a somewhat cramped purpose (Social and Ethical Interpretations in Mental Development, p. 106.) His little girl started to build a church out of blocks arranging the blocks, as she had been taught to do, in the form of a Greek cross. Suddenly the cross lines suggested to her something far more original and interesting than a church and she proceeded to add a second set of cross lines. "A church does not have two cross sections," said her father. "No," exclaimed the delighted inventor, "it is not a church, it's an animal with four legs and a tail."

(Abbott Thayer's Stevenson Memorial). Legouve (quoted by Paulhan Psychologie de l'Invention) tells how Rachel asked him to write a play for her and how in its conception

everything centered round an intensely dramatic poisoning scene in which all Rachel's powers were to be displayed. But when almost ready to rehearse, Rachel declared that the poisoning scene ruined the play and made the character an impossible one, and gradually with much agony Legove came to agree with her and destroyed the scene for which the whole had been undertaken.

So Musset said, "I often turn against my favorite hero and have him worsted by the enemy," and from a subtler point of view a contemporary author tells me that though the plot of his drama turned on the suicide of the hero, that as the play became clearer, the hero absolutely refused to commit suicide. In this case the author came to see that the hero knew better than he and that by his refusal he had saved the play from melodrama. Our plan is vague and ought to be.

In chance suggestion is our opportunity for originating, and when our purpose is inflexible we tend to kill it by our efforts to keep it the same.

Emerson's daughter took her father to Egypt for refreshment and stimulus. He was most unhappy and restless, incessantly longing for home and the quiet of his study, but Miss Emerson had definitely planned that he should go to the second cataract and with unconscious ruthlessness of purpose she carried through very preconceived detail. Was it not perhaps for that very reason that Emerson found in travelling so little of a stimulus to fresh perception?

When our purpose draws its exclusive iron bands about us, we kill the life-giving tissues in our efforts to kill the invading germs of the hap-hazard.

The law of association leads us to repeat, unless our purpose is illumined by what it meets. If we try to speak words without any meaning, we begin glibly enough with a fair

variety, but in a few minutes we are repeating. So professors giving the same courses year by year almost inevitably use the same words.

Now this tendency to repetition would be overwhelming, if it were not for the influence of outside forces, but fortunately for our originality we are never except in deep sleep or in times of great mental concentration, wholly unaffected by the world outside of our plans. We drive along the park making plans about a friend in a distant city, but the trees and houses and people we see affect us far more vividly than our vague uncolored memory and from the sight of them springs suddenly it may be, a new idea that will help that distant friend.

Every plan is and ought to be vague I said, and as this is so it is all along open to suggestion. It is then not strictly accurate to say that we have an idea and then express it. This seems to imply that it was there all along, but no, it is created as it goes. The words we accidentally use change more or less our original idea which was so vague as to allow much shifting. Write a paper on Charity and the words you use will change your predetermined ideas. In art again we invent by carrying out; our vague sketch develops very differently from what we meant, the notes he strikes by chance as he sits down to the piano suggest an improvisation to the musician; an accidental blot gives a new conception to the designer.

III. The function of Purpose and its relation to Chance. If we fully admit the play of the unforeseen in bringing novelty what becomes of purpose? Does it still remain true that purpose aids creative activity or is it all due to chance, i.e., to activities other than ours which we cannot anticipate?

My answer is (a) Without purpose there is no chance and (b) Any purpose in proportion to its width and strength changes chance to my chance.

As I said before, in defining the relation of chance to lawlessness there is no chance in the world without purpose. It moves steadily on its unastonished way (Glacier). “The event in itself is pure water, (Maeterlinck says in *Wisdom and Destiny*) and has neither savour or purpose or color.”

(b) If it is true that without purpose there is no chance, a closer study of the cases of invention will show us that purpose is somewhere concealed even in the cases which are used to exalt chance.

I think you must have felt that in the cases of children’s inventions or of the birth of Darwin’s purpose to sail in the *Beagle*, there was a certain selective interest, though possibly it was not clear enough to be called purpose.

The case of Legouve’s drama for Rachel where the development of the poisoning scene resulted in its destruction shows purpose nourishing itself on chance and triumphing because the destruction of the minor scene was caused by the fulfillment of the more fundamental purpose of success in the drama. So a man may start to defend a dogma which he thinks essential and finding it to be false, abandon it because to get at the truth is his deepest purpose.

Many of the examples which Souriau gives illustrate the necessity of a purpose to grasp the opportunities of the unexpected. It is perfectly true that the poet or artist who so fixedly plans his poem or picture that he leaves nothing open to chance will not be original, but equally true that the poet drifting in the arms of chance will find little but sea-weed.

“God giveth to his beloved in sleep.” “Yes”, says Hegel, grimly, “but what they get is mostly dreams.” It is wide awake vividness of interest that makes chance of value.

A couple of more or less apochryphal anecdotes about Newton will illustrate this. Newton said, according to one account, that he discovered the law of gravitation because he

was always thinking of it. Another tradition says that he thought of it when he saw the apple fall, but of course without the (inchoate) plan of discovering the laws of nature he would never have worked out the significance of the apple's fall. We all see apples fall and think nothing more significant than I am glad it did not hit me, or there's something to eat.

It was the clearness and width of Newton's purpose that brought him the chance of seeing the significance of the apple's fall and this brings me to a distinction of importance which I call

The relation of chance in general to my chance.

Any interest, affection or purpose is like a magnet to circumstance. In proportion to its strength and width it attracts to itself from greater and greater distances all that is akin. A striking case of the relation of "chance" to a magnetizing interest is given by Paulhan. (Psychologie de l'Invention).

Daguerre was experimenting with photography by exposing plates to light and one day he left a plate which had been exposed to short a time to have any image on it in a wardrobe. When he took it out later he found the picture on it and to discover the causes he tried the experiment again and again removing each time one of the articles in the wardrobe. Finally he found that the only thing which affected the photograph was a little box of mercury and after making more accurate tests with this he brought it into available use. Now, of course, there was "chance" in this, but I would only reveal its message to the seeker who had a definite intent.

Chances leap to meet the man with a strong purpose. I go along a country road and see nothing but dust and blurred foliage. My companion is excited at every step by a new discovery, a glacial scratch on the rock, a gentian in the marsh, or a foot-print he cannot recognize. It is all because he has a vivid interest or purpose. To put the distinction briefly

the man of no particular purpose talks ruefully of chance in general, the man of purpose follows the game, says "Here's my chance!" and takes it.

It is this truth which is expressed in Maeterlinck's *Wisdom and Destiny* (42). "Misfortune like water, expresses the form of the vase that contains it....Even as the soul may be wherein it seeks shelter, so will the event become tender or hateful, deadly or quick with life. To those around us there happen incessant and countless adventures whereof each it would seem contains a germ of heroism, but the adventure passes away and heroism there is none. But when Jesus met a Samaritan, met a few children, met an adulterous woman, then did humanity rise three times to the level of God."

One home-thrusting illustration may give point to my doctrine of the relation of chance and purpose, the illustration drawn from the relation of my paper tonight to the Seminary. It is in part a matter of chance what I say. During the weeks I have thought about it I have encountered many things not directly concerned with it which yet have affected it, but the reason I noticed and held these ideas or illustrations has been on account of the magnetism of my interest in chance and my purpose of writing a paper. So to each of you – there will be, I hope, something unexpected in my paper and yet each will seize what is akin to his central purpose or interest.

Mr. Yerkes will consider the relation to variation of species, Mr. Hocking the primacy of chance or purpose. Mr. Bacon whether my substitution of my chance for chance is valid.

If, however, nay of you is without an interest which is within the magnetic field of my suggestion, he will get just nothing at all, and the paper will in so far be a waste product. Or if his purpose is defined rigidly throughout, there will again be no chance of effect.

The situation may be exemplified by the purpose of catching trout in a mountain stream. If you sit by the stream without any rod you will probably see plenty of chances to catch trout, but they won't be chances for you. On the other hand if you resolutely and stubbornly thrust a clearly-hooked line into the water and push it deliberately toward each trout you see, you won't catch any either. New ideas are shyer than trout and even if they glide for a second into the hand of a man without a rod, he can't hold them unless he has the hook of purpose. Nevertheless, and he is the crux of the situation, we must conceal the hook and make random gyrating, illusive movements, almost forgetting that we are not the fly instead of the fisherman.

I shall now try to gather up the result of my analysis.

In the first place the idea of purpose has not lost its hold as an element in creative activity.

In the wide darkness that surrounds us it is our purpose and the purpose of those we love and so understand that a lone light and order our world and in so doing reveal our chance. As in a snowstorm, the numberless crystal flakes drift by us alluring and bewildering by their incessant movement and their strangely beautiful forms, so the myriad opportunities, joys, tragedies, mysteries glide silently by touching us for a moment and forever blending with the past at our feet while from the sky still whirl the endless flaked of the future.

What we get from all these opportunities depends wholly on our width and clearness of purpose; without a glimmer of purpose they are like snowflakes falling into the sea. Purpose is essential to the opportunity of original work, although as we saw purpose is also formed and molded by opportunity, suggestion, need and demand.

Nevertheless, I agree to the central meaning of all this criticism of the inadequacy of purpose to explain creation. The soul of the objection seems to me of vital significances and its meaning essentially this; “No man, and so no purpose, liveth to himself and no man dieth to himself.”

The inadequacy, and in so far the falsity, of the idea of my purpose starting on its predetermined career to its chosen end is that it ignores 99/100 of the life of the world, which life, inclusive both unconsidered elements in himself and of the myriad streams of other purposes, inevitably asserts itself to mold, to frustrate, to fortify and enlighten his purpose.

Through criticism the concept of Purpose in relation to Invention has been purified and enlarged and in three aspects.

1. We have found that invention is the product of the whole man rather than of thought or will alone, and hence if anyone conceives his plan narrowly as attainable by deliberation alone, other elements in his nature, feelings, traditions, instincts, will come forward to mold it. Musset will turn against his favorite hero.

2. Invention is the product of the activity of the universe kept in focus for me by my plan, but not due to my plan alone, and hence, in so far as I think of my plan as independent, it is surprised and perhaps overthrown by the plans, activities and needs of others. Rachel forces Legouve to see that his poisoning scene is not in place.

3. The doctrine of my last paper that a purpose can only keep the same through change is re-enforced here and if we follow the direction in which an inventive purpose goes in order to keep the same we shall find it pushing out toward and within the whole.

This is the corollary of the idea that the wider and clearer the purpose, the greater are its chances. Ultimately all is grist that comes to its mill.

Our central discovery in this analysis may be put in Emerson's phrase in the Essay on Fate. It is "the cropping out in our planted gardens of the core of the world.