

## The Visionary Eye

*Essays in the Arts, Literature and Science*

*J. Bronowski*

January 24–26, 2019

The portrait of the author on the cover is that of a much reproduced photo, showing him gazing at you sadly as well as earnestly. Sadly because of the existential predicament of mankind, earnestly, because he is a very serious guy, who expounds on exalted topics. Unfortunately the book gives no photo credit. Who took the picture, and when? The book itself is a posthumous publication, where pieces of his *Nachlass* have been edited by his widow and a certain Ariotti. There is always a problem with such publications as they are not necessarily in the form the author himself might have wanted, and in fact there are large overlaps between the essays, which he might have wanted to iron out.

Bronowski was of two cultures, denying that there really was any deep difference between them. Starting out as a pure mathematician at Cambridge, writing a thesis on some old-fashioned algebraic geometry, which was popular in England at the time, he then drifted into poetry, was involved in war time research during the war, and then became more and more enthralled by how humans really differ from other animals which would eventually lead to the book 'The Ascent of Man' to be followed by a BBC-series, which would take its physical toll. Soon thereafter he would succumb to a heart attack in Long Island aged 66.

Bronowski is a so called communicator, he writes for a wide public not to fellow intellectuals, admittedly with great skill, but with the inevitable drawback of appearing somewhat middle-brow to his colleagues. Writing to a wider audience, whose interest you can only hope for, not to take for granted, has nevertheless its advantages. You need to think un sentimentally about what you say. To parse it down, to cut out mere jargon, and to reduce your message to the essentials, yet trying to convey it as vividly as possible. It means in short to take a fresh look, just as you always have to do when you popularize. Not so much to simplify by removing the inevitable technicalities (which often has the effect of making the account as incomprehensible to layman and expert alike) but to rethink them anew, and in fact place yourself in the shoes of yours as a child, with only a fragment of your present experience and erudition, but with your intelligence unimpaired. Anyway when you expound philosophically on abstract topics there is a danger that you produce nothing but homilies. Either statements that no one would disagree with, or just plain silly ones, which are easy to contradict. And it is not always so easy to make the distinction. Now let us take one quote that at first strikes you as very surprising but true, the kind of thing you are really looking for in a book like this.

*Knowledge which another man supplies is always a constraint; any addition to your own knowledge is a liberation.*

Of course quotes should always be put in a context in order to be properly interpreted.

The freedom he refers to is the freedom to create; and of course constraints curtail this freedom. And the specific situation in which this thought arise is when an architect has to design a building. He cannot do that in any way, they are constraints imposed by physics and the nature of the materials to be used which restricts his freedom. However, as an architect he had experience, and out of this experience he has learned things, and learning things means acquiring knowledge, and on this knowledge he can draw freely as to overcome the obstacles that has been put in his way. In fact, as I am fond of saying, without obstacles to be overcome and constraints to which to comply, your imagination is not provoked. So how should we really interpret this? If we take it too literally, we can of course contradict it trivially. A man may provide me with instructions which will in fact save my life and hence liberate me from death, the ultimate state of lack of freedom. Also how do you acquire knowledge, is it not always externally supplied by other men (and women)? This is of course a conception of learning and increasing knowledge that comes naturally to people who thinks in terms of facts, nowadays within easy reach by the tips of your fingers in the age of internet and instantaneous instruction and information. But you do not only learn from facts, facts have to be internalized and manipulated, and this kind of digestion of facts, provides a way of building up knowledge internally. Thus what it really says is just that knowledge as facts restricts your action, while internal knowledge supports and drives your imagination, and freedom is in fact the same as freedom of your imagination, which grows with the power of the latter.

It is a common misconception, against which Bronowski rages, that science is dull and has nothing to do with imagination, while the arts, in particular poetry, is imaginative. In school you are told that in addition to such sterile subjects as mathematics you need to be creative, and by that is meant drawing, making music, and writing poetry. Mathematics in particular and science in general are seen as lists of facts and rules to memorize and follow, and by such constraints there surely is no room left for the imagination! But remember there is no imagination except when there are constraints. One can blame education of course, on the other hand for pupils of the right temperament it takes not much prompting to see the fascination of science, and a teacher has to be almost maliciously uninspiring to quench that desire.

Bronowski holds that both science and art promote knowledge, while that of science is general and explanatory, that of art is particular. But this is just a first obvious linear approximation of the case, and Bronowski does not probe deeper, maybe because he does not want to alienate is audience, or he has not thought deeper of the subject. He is right on the spot when he claims that knowledge has to be internalized, made into you own, as if you had discovered it<sup>1</sup>. In order to understand a theorem it is not enough to memorize its formulation, this is equivalent to use a gadget the technology of which you are totally unfamiliar with (as is the case with most users of modern gadgets), nor is it enough to follow the proof step by step, even if that would be a good first step. Not all steps are equally important. What is the most important in a proof is not what is written but the guiding ideas, which cannot really be written down and communicated that way, but which have to be reconstructed in your mind, not only from the proof itself but also your own

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<sup>1</sup> it could be that some cases of plagiarism in science, especially in mathematics, meaning omission to accord credit to where credit is due, could be unintentional due to a successful internalization

experience. Maybe you almost did come up with the same idea yourself, in which case the process will be easy, or it even resided in you subconsciously and hence you will recognize it right away and feel it pop up (why did I not think of it!). Looked in at this way the difference between a poem and a proof does not seem that great. In poetry you go from the particular to the general, although you may never need to formulate the generalization, you only 'understand' it. But also in mathematics, a special example may by virtue of its concreteness explain a general theory much better than a general abstract formulation. True, the exact wording of a proof does not matter, you are free to paraphrase it in anyway you seem fit, as long as you really understand it, meaning that you do convey its idea, or maybe even better, the underlying idea of the idea, thus improving on the proof. This is how mathematics progresses. But in poetry you are not allowed to paraphrase nor to improve, the poem is a holy thing, and you are not allowed to change a single word, not even a letter (although in prose modernization of orthography is permitted), but you may of course change the font and everything to do with the printing, and to make a copy does in no sense diminish the worth of a poem, on the contrary. Music is a little different as it cannot be fully encoded in some script but has to be performed and hence interpreted, but as with literature it cannot be anchored into a unique physical artefact. Paintings are different, they exist as originals, and this has made possible the financial speculation racket in such. But of course Bronowski does not touch upon those extremes. Yet the particularity as uniqueness points to a significant difference between science and art. The original manuscripts of Darwin would involve a high monetary value, but this has nothing to do with its scientific worth only sentimentality.

What is beauty? Bronowski wants us to see this in a wider sense. Beauty of an object is but a reflection of the beauty of the act that created it, meaning its conception and the commitment and care that went into its execution. Of course not all acts are beautiful, far from it, but without understanding the whole situation involved it becomes difficult to appreciate the beauty of an object. The beauty of an object is not like a secondary quality, such as its color, but a distillation of its totality. You recognize a man-made object, a so called artefact, by seeing in it not only its purpose but also how it was made. In the natural world there are no purposes, and things are not made by design. But purpose and the concomitant design are the hallmarks of human creation. If you cannot divine the purpose nor the way it was made, you cannot fully appreciate the beauty of the doing, hence nor the beauty of object as such (which of course cannot be fully separated from its purpose and design).

Why does poetry function? According to Bronowski our inner selves are very much alike, hence our capacity for empathy and mutual understanding which goes beyond mere exchange of (verbal) information. We are all alike, but we are also very much ourselves and hence unique and differing from everybody else. The Human predicament is expressed in both our sociability, which we share with some mammals, and our individuality, which may be more pronounced than that of any other animal. Language is the prime example. Language would not exist unless it was social. We learn language through a shared experience, like with any other aspect of culture, but language is special as far as it is part of our phenotype unlike any other cultural trait, in fact it is the basis for all culture. On the other hand once given language we can turn it inside, and unlike the primitive utterings of

other beings, we can create inner worlds out of it, as well as use it as a cognitive crutch<sup>2</sup>. Anyway language allows us to have a rich inner emotional life triggered by verbal cues. What a poem does, often saying the same thing over and over again in slightly different way, is to resonate with you and your emotions, differently for different people though. This is no doubt true, but it is not the whole truth of course. Vivid image is not enough, it also have something to do with the music of how words are put together, which is a more abstract quality of a poem than its direct emotional appeal.

Now why do we appreciate Shakespeare? Is it something that can be explained on purely objective grounds, or is it part of a social convention. Lines that are cited from his plays and held up to us to admire, would they have engendered the same kind of respectful almost exultant attention if they had been found fragmented in some obscure text? There are many pieces of boring mathematics containing beautiful ideas, which would have been admired if they had turned up in more fruitful contexts, but are now ignored<sup>3</sup>. Artistic appreciation is also a social thing, it is hard to see it separated from a tradition without which it hardly makes sense. On the other hand some traditions show more vitality than others, and on that level there may be some objective standards.

Bronowski does some in-depth studies of some of his favorite poems. He chooses from Blake (on which he wrote a book), Thomas, Rilke, Donne and even Eliot, whom he once professes not to care much for, then writes about with respect. An interesting aside is that he shows that Shakespeare, with no concrete visual imagery may provide a more vivid scene than those who litter the lines profusely with visual hints and descriptions. Not that the latter is to be necessarily rejected, but it indicates that the impression on poetry makes on us is very hard to predict. Can you learn to write poetry, are there manuals that teach you? There are manuals for amateur painters, but I would not give much for them, there is an element of cheating. There are courses given on literary composition, but somehow it seems to take all the fun away. True people went to art schools (now in modern art the handi-craft skill of art has been downplayed), and in the past burgeoning painters went to practice with a master, like as with any other guild, and which is still done in science; yet all those methods of instructions seem to have in common the act of emulation. Artists of the past copied other painters paintings, and a poet was to learn

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<sup>2</sup> Bronowski cites some research that had been done on children, apes and dogs. Food is hidden beyond closed doors and the animals are easily taught that this is the door with a lighted lamp above. Then the lamp is turned off and the question is for how long they will remember it. If you have an internal language you can encode its position in some way and hence more easily remember it. And children do well. But animals, so the theory goes, cannot retain memories denied such props. One dog refused to have his head turned away lest he would forget. A clever dog Bronowski remarks, and you are bound to sympathize with it. Like all such 'scientific' experiments in psychology you tend to become a bit suspicious of them. In many other contexts animals have excellent memories, rivaling even surpassing those of humans. Chimpanzees are reported to excel over human subjects on such games as 'memory'.

<sup>3</sup> I know I should produce particular examples, but they are of course not so easy to come by. There is no reason why they should not exist, although they are bound to be hard to find. An idea can only be judged and identified as good by the consequences it produces, but anyone who has been forced to look through an uninteresting piece of mathematics may at times respect the ingenuity which has been employed and surely once in a while there must be rather clever arguments put to no real use.

from reading poems, maybe copying them in an effort of internalization. If you have the right urge and temperament you may become a poet, and what you will write will be based on intuition, which in the popular mind is seen as opposed to science where there is no magic intuition at play. (Bronowsky would rage). For the latter the author quotes a couple of rhymed couplets by Blake.

*My mother groan'd my father wept  
Into the dangerous world I lept  
Helpless, naked, piping loud  
Like a fiend hid in a cloud*

*Struggling in my father's hands  
Striving against my straddling bands  
Bound and weary I thought best  
To sulk upon my mother's breast*

Bronowski had presented the verse to a renowned Russian linguist Roman Jakobson, for him to analyze. He had produced several pages of patterns he had found. Bronowski had reacted with disbelief. Was that really the way Blake had written the poem, as if he had employed a computer. Obviously he had not, and many of the patterns found were no doubt spurious, others more interesting, subconsciously generated because this is how the human brains work (whatever that means in this context). A poet does not consciously look for rhymes, they come to him unprompted, as Goethe remarked, to consciously aim for rhythm and rhyme would be torture. But by the way a poem is a human artefact if any, how can we see the purpose here and how it is made? In general terms we can resolve it. The purpose is of course to express and convey an emotion (this is of course not the whole truth). How is it made? Just copy it! (That would miss the point, but of course a systematic study of poems may give an inkling of how they are constructed without necessarily enabling you to formulate it). Thus there is after all a distinction between technical artefacts, for which those questions are meaningful, and artistic ones, for which there are no applications.

What emotional messages do poems have? Often rather general one and rather banal when translated into prose. Such as say 'love conquers all', or as in his example by Dylan Thomas, that for a young man to grow old is exciting, but for an old man it is tragic. When you are a young man you would not understand it, but when you are old, you would find it almost unbearable. But do you have to have the experience to understand it? And besides Thomas never attained any remarkable age dying before turning forty. Or was he prematurely old in mind and outlook? I doubt it. More interestingly though, Bronowski contrasts the complicated emotions conveyed by serious poetry to the scientific knowledge of psychology which appears flat in comparison. Poetry is far superior to science in expressing the human condition and speak directly to it. Maybe psychology is not real science? There is a serious problem with social sciences, or that objective methods only go so far to penetrate the human psyche? <sup>4</sup>

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<sup>4</sup> Can psychology really describe the intricacies of my 'soul' is a common reaction. The British philosopher Collingwood was very suspicious of it.

Finally there are a fair amount of pictures included in the book, but what Bronowski has to say about pictures is not really worth the trouble to repeat. His interests and gifts go to poetry not the visual. Maybe he has a visual impairment as he expresses surprise that certain people immediately summon up a picture of say Eisenhower, whenever they hear his name mentioned. Is it not that normal, provided that you are reasonably familiar with the appearance of the individual in question?

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