

[SLIDES 1]

I should say to begin with that although I am going to run some slides, in the main I am not going to talk to them, nor will they always relate to what I am saying. My presentation is almost entirely concerned with Gabo's theoretical position. I hope this won't distract you too much, but they will perhaps prompt further topics for discussion.

When I started my research on Gabo I was faced with a dilemma. The current view of Gabo appeared to be that he was knowledgeable about, influenced by, and positive about science. [SLIDES 2] On the other hand, I found it difficult to understand his Realistic Manifesto (1920) on that basis. Gabo's reputation with regard to art and science was, I believe, a result of wishful thinking and inadequate criticism. I also believe, in retrospect, that one is misguided if one attempts to interpret the Realistic Manifesto solely, or even predominantly in terms of physics, mathematics and engineering.

The situation may have been exacerbated by Gabo's writings which are full of ambiguities, paradoxes, and outright self-contradictions, and yet suggest that he held true to the principles of the Manifesto. [SLIDES 3] Also, most of the secondary commentary on Gabo has been based on limited evidence, particularly Gabo's own testimony. Few authors have been able to pierce that barrier to independent, appraisal and judgement.

Gabo's first published statement on art and science does not occur until 1937, when he was 47. Prior to that, his attitude towards science was peculiarly circumscribed, predominantly sceptical, although paradoxically, he may be seen to have sided with one of the more advanced strands of thinking in the philosophy of science.

In the Realistic Manifesto, Gabo apparently rejected Naturalism, Symbolism, Romanticism, and Mysticism. A careful reading of the Manifesto reveals his rejection of Symbolism, Romanticism, and Mysticism to be far from forthright or absolute. [SLIDES 4] In his youth Gabo greatly loved the poetry of the Romantic poets Afanasy Fet and Fyodor Tychev. He also admired the Symbolist painter Mikhail Vrubel, positions he retained throughout his life. Any idea, therefore, that Gabo rejected these movements in favour of something more compatible with modern scientific-technical developments is doubtful. Studies of Russian Symbolist theorists such as Bely and Bryusov reveal complex attitudes towards science, in fact quite affirmative and, by comparison with the materialist tradition of Belinsky, Chernyshevsky and Pisarev, more consistent with Gabo's outlook. We know that Gabo studied literature seriously as a youth, and considered becoming a poet. There are, therefore, grounds for believing that Gabo may have been aware not only of Symbolist poetry, but of Symbolist theoretical writings as well.

Throughout his life Gabo was confronted by, or had dealings with, people holding mystical beliefs or exhibiting mystical tendencies, people attracted to mystery rather than to scientific enlightenment. Three of his most important patrons, for example, Katherine Dreier, Hilla von Rebay, and Mrs Sadie May. Most

striking, is that Gabo's first, common-law wife, Elisabeth Steinert-Richter, patronised an especially odd individual, Dr. Oskar Goldberg, who attempted to reconcile Kabbalism with biology. [SLIDES 5] Meetings of the Goldberg circle were held at the Gabo-Steinert home in Berlin in the 1920s. I do not propose that Gabo was a mystic, although he did believe in predestination and in his ability to divine a person's character from their writing. But rather I wish to indicate Gabo's life-long tolerance of mystical tendencies in others, and thus suggest that he sought a philosophical position which could encompass such views.

Besides Symbolism, Romanticism and Mysticism, Gabo also apparently rejected Naturalism in his Manifesto. His grounds for doing so are significant. According to a passage in his Mellon Lectures of 1959, Gabo viewed the development of the camera as a scientific invention which indicated the nature of the scientific vision of the world. [4 mins] Because the camera, to a great degree, supplanted Naturalistic painting, its very invention indicated that Naturalism itself was the product of scientific rather than artistic vision, and from that Gabo wished to escape. Although one might wish to question Gabo's analysis and reasoning, that was his position, and it was one shared, quite explicitly, by Malevich.

[SLIDES 6]

Let me turn now to one of the most important periods in Gabo's life with regard to the formation of his ideas: his education in Munich. One of the most oft-repeated facts about Gabo is that he studied medicine, science, mathematics and engineering in Munich. Different authors lay stress on different elements. It is also remarked that Gabo attended lectures in art history given by Heinrich Wölfflin. Generally greater stress has been laid on his scientific studies, and his philosophical studies, about which Gabo kept silent, have been virtually ignored. [SLIDES 7] (I am showing here a couple of Gabo's matriculation sheets which document courses to which Gabo subscribed). Attempts have been made to link Gabo's development with Einsteinian physics. On the other hand, those who have tried to characterise Gabo's philosophical position have invariably tried to link him with some form of idealism. Whereas Gabo's rejection of materialism is well-accepted, this is not so of his rejection of idealism.

[SLIDES 8]

There is a great deal to be said about Gabo's education. Here I wish to concentrate on just one aspect, the proposition that Gabo was exposed to the views of the physicist and philosopher, Ernst Mach, and that this provides a crucial key to understanding Gabo's attitude towards science. I wish briefly to address four questions. What is it about Mach's philosophy that is pertinent to Gabo? What grounds are there for believing Gabo was exposed to his work? Hence, what do I mean by Mach's being 'a key to understanding' Gabo? And finally what implications does this have for reevaluating Gabo's reputation? [6 mins]

[SLIDES 9]

Ernst Mach is best known for having lent his name to the unit of speed, the Mach number. He was a physicist. His more influential work, however, was in the realm of psychology, philosophy and the history of science. He sought to reconcile psychology with physics, and hence he developed a system of thought based on the Analysis of Sensations, the title of one of his best known books, first published in 1886. The first chapter of this book is boldly entitled 'Introductory Remarks - Anti-Metaphysical.' The significance of this should not be underestimated. 'I should like the scientists to realize,' Mach wrote, 'that my view eliminates all metaphysical questions indifferently, whether they be regarded as insoluble at the present moment, or whether they be regarded as meaningless for all time.' [AoS trans. p.369] Clearly the latter view prefigures the logical positivism of the following generation. Mach's anti-metaphysical starting point provides the first and most important similarity between Mach and Gabo.

[SLIDES 10]

Mach proceeds from the premise that our knowledge of the world is ultimately grounded in our sensations. The common objects of daily life, therefore, he sees as 'complexes of sensations,' and even such broad entities as "matter," he states, 'must be regarded merely as a highly natural, unconsciously constructed mental symbol for a relatively stable complex of sensational elements.' Furthermore, he goes on, 'much more must this be the case with the artificial hypothetical atoms and molecules of physics and chemistry...they remain economical ways of symbolizing experience.' [AoS trans. p.311.] With very little alteration this could be Gabo speaking. Rather than the word symbol, Gabo used the term 'image.' This was a word, in the French 'image,' constantly used by Henri Bergson, whom, as Gabo told his younger brother, he regarded, so to speak, as one of his teachers during his Munich years. Yet Mach also uses the German term for picture or image, Bild. I would refer you to Gabo's rejection of the symbols and images of the scientist, for example, weight, momentum, ratio, etc., in his Mellon Lectures, and his notion that electricity for example, was not discovered but created. Most important, however, is Mach's use of the qualificatory adjective 'constructed.' [SLIDES 11] For the notion of construction is, of course, at the heart of Gabo's philosophy which he termed 'The Constructive Idea in Art'. [8½ mins]

I should also draw attention to Mach's 'principle of economy,' the application of which should guide one's judgement as to which 'constructed mental symbols' or 'images,' one should adopt. Recalling the questions posed in the brief for this session, Mach also allied his principle of economy with the notion of 'the aesthetics of science.' In a similar way Gabo said that one chooses one's images according to 'which of those images appear to me or to you more coherent, more harmonious and more cogent, above all, more acceptable as a means for our orientation in this life of ours.' (letter to Solé-Leiris, 1947.) [9 mins]

A lot more could be said about similarities between Gabo and Mach, in particular with respect to Gabo's Manifesto. Mach, however, was not alone in tending towards idealism. I say

tending towards idealism, because to this day, arguments persist over whether or not it is correct to tag Mach as an idealist. If one accepts the arguments of those who deny it, then one must accord the same respect to Gabo's position. Yet, why do I lay such stress on Mach as opposed to others who followed a similar philosophical path?

[SLIDES 12]

There are at least five contexts in which Gabo may have encountered Machian views. I will mention three immediately. It is likely that Gabo was introduced to Machian thought through a follower of Mach, Oswald Külpe, one of whose courses to which Gabo subscribed at the University. Or again, it is likely that Mach would have featured in another course, given by Alexander Pfänder, on Erkenntnistheorie, that is the theory of cognition or epistemology. Also, Mach's book on Mechanics (1883) went through many editions and was widely used in teaching. Treating the subject from a historical perspective, Mach raises many of the philosophical points on which he later expanded. In passing, he also devoted a chapter to discussing the relation between mechanics, theology and mysticism. Gabo may have encountered this book either at home, his family after all was steeped in engineering, or through his own studies of physics and engineering in Munich. [10½ mins]

[SLIDES 13]

Before discussing Mach further I should like to deal with the idea that Gabo may have been influenced by the Einsteinian revolution in physics. This idea is prompted by the emphasis which Gabo accorded to space and time in the Realistic Manifesto, and thereafter, backed up - rather weakly - by Gabo's recollection of discussions of Einstein which he witnessed in Munich. Gabo rarely mentioned Einstein, however, without being prompted to do so. Furthermore, when he did mention Einstein spontaneously, he did so in ways which make it unlikely that he considered Relativity of central importance in his own development. Be that as it may, there exists an unpublished document which, I believe, puts to rest any such conjecture.

Entitled 'Die Probleme der Raum und ihre Fälschungen' - the Problem of space and its falsification - this document probably represents Gabo's contribution to a series of talks held at the Kestner-Gesellschaft, Hannover, in 1930, when Gabo exhibited there. [SLIDES 14] Gabo's talk was one of a series, which included Alexander Dörner, who spoke on the 'The New Conception of Space in Pictorial Art (the Space-time Problem in Painting and Film)'. A further contribution by a physicist, J. Leman, tackled 'The New Conception of Space in Physics (the Space-Time-Continuum in Einsteinian Relativity Theory)'. In his text, Gabo once more professes the importance of space and time in his work. But, he states, and I translate: 'space and time were put forward not as some kind of philosophical principles of a new aesthetic, but as precise, completely concrete and real means of the pure formal work of the new art.' And he goes on: 'it was no theory brooded over and issuing from the study of an encloistered research worker, but so to speak hanging in the air and as a practical solution [its time] was ripe.'

[SLIDES 15]

Note Gabo's use of the phrase 'hanging in the air,' a variation on the concept of Zeitgeist the principle whereby Gabo often explained relations between art and science, historically and in his own development. The word Gabo uses for 'research worker' is Forscher, which may equally be translated as scientist. Gabo does not refer to any particular scientist, nor to any specific scientific theory, but he questions, in dismissive tones, the discussion of space by other artists. In particular he cites Van Doesburg, and De Stijl artists more generally, whom, he says, wish to bring completely false terminology into discussions about art - terminology, and I quote, 'connected with the highly abstract sciences.' ['in der Riehe von der hohen abstrakten Wissenschaften.'] [13 mins]

Now immediately I am reminded of Mach. In his psychological reasearch, besides the normal five senses, Mach laid emphasis on what he called 'time-sensation' and 'space-sensation.' Furthermore, this was a point, adopted from Mach, on which Gabo's lecturer, Oswald Külpe, laid particular emphasis (Boring p.395). This is consistent with Gabo's determination that space and time were to be concrete and real elements in a constructed work of art.

[SLIDES 16]

What may be even more significant, however, is the crucial part played by Mach's thought in Einstein's development of the Theory of Relativity. I can not go into details here - there are several excellent accounts of what happened. Mach's significance in this context, however, lies precisely in his questioning the reality of the fundamental notions of physics, a debt acknowledged by Einstein. Furthermore, there developed therefrom a vigorous debate and a flood of publications discussing the wider question of the physical Weltbild, or world-picture, a debate involving eminent physicists in Munich such as Max von Laue, which came to something of a head in 1912, precisely when Gabo recalled attending such discussions. What I would suggest, therefore, is that rather than the Theory of Relativity, what was significant in Gabo's attendance at such meetings may have been his exposure to, and perhaps unconscious absorption of, the wider significance accorded to Machian scepticism, 'hanging in the air,' within the scientific fold. This then is a fourth arena in which Gabo may have been exposed to Machian philosophy. [15 mins]

[SLIDES 17]

I am sensitive to the presence of Linda Dalrymple-Henderson and Samuel Edgerton, for, as some of you may know and as may be going through their minds, they contributed together with Arthur Loeb, to a most pertinent correspondence in the columns of Leonardo on the question of 'cause and effect.' What therefore do I mean by proposing Mach as 'a key to understanding' Gabo? I think it neither necessary nor wise to be dogmatic here. I have indicated that it is likely that, early on, Gabo was exposed to, and absorbed something of Mach's philosophy. Inasmuch as this is so,

clearly Mach might act as a key to understanding the development of Gabo's views, even allowing for Gabo's Hannover statement of 1930. Should this be doubted, I would still propose Mach as a key to understanding, because he constitutes the closest model whereby we can characterise, and in that sense understand, Gabo's position.

[SLIDES 18]

Indeed I go further. I propose that the significance of Mach in the history of Marxist-Leninist thought in the first two decades of the 20thC, is not just interesting, but fundamental with regard both to art and to science. I would simply refer you to Lenin's virulent attacks on so-called Machists and 'god-builders' (one might more precisely say 'god-constructors'), in particular A.I. Lunacharsky and A.A. Bogdanov, the two people in charge respectively of the two most important post-Revolutionary organisations dealing with the arts, Narkompros and Proletkult. In passing, Bogdanov's Monist equation of spirit and matter constitutes a striking parallel with Gabo's insistence on the fact that our 'images' constitute our reality. [17½ mins]

This constitutes a fifth arena in which Gabo may have been made aware of Machian philosophy. Yet whereas this aspect of the Revolutionary decades has been well treated by historians of Soviet government, such as Sheila Fitzpatrick, [SLIDES 19] by historians of Marxism such as Leszek Kolakowski, and of course by historians of Russian philosophy, it has been relatively neglected by art historians. I believe not only that Mach constitutes the crucial key to understanding Gabo, but that, particularly because of Lenin's attack, Mach will prove to be important in reevaluating the views of many other broadly 'left-wing' artists within the Russian avant-garde, as well as other intellectuals. [Perhaps mention Kirk Varnedoe, et al.] [18 mins]

I said earlier that Gabo's first published statement on art and science was made in 1937. This was his opening essay 'The Constructive Idea in Art,' contributed to Circle, edited by Gabo, Leslie Martin, and the painter Ben Nicholson. In the two years prior to this, Gabo had developed one of his most important works, one might argue his chef d'oeuvre, Spheric Theme. [SLIDES 20] The conjunction of these two events is, I believe, no coincidence.

Gabo made his final move from Berlin to Paris in about 1934. To put it mildly he did not enjoy his time in Paris one little bit. Yet while there, he struck up a friendship with Winifred Nicholson, the estranged wife of Ben Nicholson. It is only recently that the intimacy of this friendship has been reported. It may, however, constitute one of the most significant friendships with regard to Gabo's reputation in the realm of art and science, for there is reason to believe that it was the Nicholsons who introduced Gabo to the writings of the astrophysicist, Sir Arthur Stanley Eddington.

[SLIDES 21]

Eddington is noted as the leader of the British expedition in

1919 which, observing a solar eclipse, furnished one of the most important experimental confirmations of Einstein's Theory of Relativity. He also wrote many semi-popular books on physics and cosmology. Gabo owned a French edition of one of these books, The Expanding Universe (1933), published in 1934. That it was a French edition strongly suggests that Gabo acquired this while he was living in Paris. The second chapter of Eddington's book is entitled 'Spherical Space,' and I am convinced that this furnished Gabo with the motive for Spheric Theme. [19½ mins]

Also of consequence is Eddington's philosophical outlook. Eddington was a Quaker, and defended both religious and natural mysticism against the materialism and determinism of many scientists. Although not submitting to the idea, he even considered the question of whether the physicist should be considered to be an artist. If Gabo needed it, here was a scientist of unquestionable eminence and capability, professing exactly the same kind of ideas as he himself embraced. Gabo's introduction to Eddington, I believe, reinforced his already Mach-like philosophy, providing stronger foundations for his subsequent public statements on art and science in England and the USA. It also explains, despite the cordiality of their relationship, why his friendship with the crystallographer J.D.Bernal, was no closer than it was. Bernal, after all, was a self-professed communist, and in his book The Social Function of Science (1939), he follows a materialist, Marxist-Leninist line, roundly castigating by name, not only idealist philosophers such as Bergson and A.N.Whitehead, but also scientists such as Eddington, and Sir James Jeans: those very scientists to whose writings Gabo was attracted. [20½ mins]

[SLIDES 22]

If I had more time, I would have liked to describe that history of discussion about art and science in Britain into which Gabo fits. Most of you will be conversant with C.P.Snow's essays of the late 1950s on the 'Two Cultures,' and it is not insignificant that the origins of Snow's concerns can be traced to his writings in the 1930s.

I would also have liked to demonstrate how Gabo's reputation in art and science steadily grew in part from his Hannover catalogue of 1930, where attention was first drawn to his scientific studies, and in particular from 1937 onwards, due to his own writings. Thereafter Gabo had to perform a balancing act between embracing science as important to his 'constructive art,' and defending the autonomy of art. Perhaps inevitably, something of a myth grew up around him, and he had trouble in avoiding self-contradiction.

Lastly I would have liked to say more about Malevich and something perhaps rather tendentious about him and Kandinsky. I must, however, summarise.

I have tried to show that in his early years Gabo was attracted less to science than some would have us believe. Indeed he reacted against materialist science. His reaction can be characterised, and was probably directly or indirectly influenced by the psycho-physical philosophy of Ernst Mach. Paradoxically,

therefore, although I would seek to puncture any naive idea that Gabo was positively influenced by science, he does reflect, perhaps unconsciously, because he himself never stated it, a writer of the utmost moment in the history of the philosophy of science. [22 mins.]