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Blurry Manifestos

Eshkol-Wachman Movement Notation and its Militarised Applications

by Arkadi Zaides¹

There are many historical examples of the interconnection between dance, choreography, and war. Dances are practised before battles, unifying and preparing the fighters to overcome the hardship of the battlefield. From early ages, the so-called weapon dances, for example, were used to simulate, recall or re-enact combats. Dances are also practised in the midst of fighting to boost morale or in the aftermath of wars - whether to mark victory or to acknowledge defeat or loss. The establishment of the nation-state and the institutionalisation of armies have led to the development of military training methods. In addition to the obstacle courses that strengthen their bodies and familiarise them with the type of tactical movement they will use on the battlefield, combat training also entails movements in unison, such as marching or saluting, and this type of choreography is often performed in front of their comrades or an audience. The battlefield itself might be perceived as a mass choreography where the two combating sides negotiate their space through the use of force. Tactical thinking determines how not only humans but also war machines move in coordination and synchronisation on land, water and in the air. There is a limited scope of literature that discusses the complex relationship between choreography and modern warfare. The book *Choreographies of 21st Century Wars* edited by Gay Morris and Jens Richard Giersdorf (Oxford University Press, 2016) arguably constitutes the first study that focuses specifically on this interrelation. By looking at diverse aesthetic and various geopolitical contexts, Morris and Giersdorf point out the more amorphous and shifting quality of modern conflicts and warfare and the more ambiguous boundaries between war and peace. Furthermore, they question whether

¹ Thanks to Iris Lana, Amos Hetz, Michal Shoshani and Mor Bashan for our conversations and Iris Lana, Yali Nativ, Anders Engberg-Pedersen, Martín Zícari and Sandra Noeth for their feedback and guidance during the writing process of this essay.

“choreography also changed its character and objective”² within the grey zones of modern warfare and address the need to reconsider its ontological state within the complexity of modern conflicts and war.

I was born in Belarus in 1979, and spent my early childhood in the midst of the collapsing Soviet regime. In the wake of the fall of the Iron Curtain I immigrated, grew up and spent most of my adulthood in Israel, a country known for its weapon industry and that has enforced decades of occupation of the Palestinian people, and I now live in Europe with its long legacy of colonisation and increasing border fortification. My personal trajectory in these specific socio-political circumstances compelled me to respond to these contexts through my choreographic work. Interest in documentary practices has led me to documents, archives, and databases that attest to differing levels of structural violence in the territories in which I live and work. Examination of these documents has become a key component of my artistic practice. Through the use of documents, I see choreography as a potential investigative tool that can, through embodied practices, intervene and question the socio-political contexts and the ideologies that shape them. Moreover, as I have demonstrated in my own work³, it can propose set-ups and procedures that are constructive in countering the official narrative produced by those in positions of power, and operate outside of the artistic field.

I was initially interested in the joint work of Israeli dancer, choreographer and theoretician Noa Eskhol and her student and later professor of architecture, Avraham Wachman, because their approach questions the notion of "document". The two, often referred to as avant-gardists (Zyman, Finkelman), are renowned for inventing one of the most simple and applicable systems that enable the precise notation of movement patterns (Yanai). However, when I embarked on my historical investigation, I was captivated by the way their system has transcended the artistic field to perform outside of its primary frameworks. Moreover, I was intrigued by the ambiguity around several of the extra-choreographic projects in which

² Gay Morris, Jens Richard Giersdorf, eds. *Choreographies of 21st Century Wars*, Oxford University Press, New York, 2016 p.12

³ Archive (2014) uses footage filmed by B'Tselem - The Israeli Information Center for Human Rights - to challenge the embodied violence of the Israeli society. Talos (2017) criticises an eponymous EU-funded securitization project promoting the development of land drone technology to survey the borders of Europe. Necropolis (2021) is based on the thorough investigation of a list - established by the UNITED civil network - which registers people who lost their lives in an attempt to enter Europe. The project commemorates and collects data on these often-unacknowledged deaths.

Eshkol and Wachman's finding have been implemented, which are in my view manifestations of the ontological shift evoked by Morris and Giersdorf in their aforementioned book. The early 20th century avant-garde movements have often been politically ambiguous and were thus seen as a threat by the ideological systems in which they operated. As dramaturg, curator and writer Eda Cufer rightly argues, the consideration of the work of avant-garde artists from a contemporary perspective, has to address "their structural-aesthetical as well as historico-political features"⁴. Moreover, it should be observed within a larger international context fuelled by the tensions of the Cold War Era.⁵ Following Cufer's observation, I wish to look at the Israeli as well as the broader international social and political contexts within which the Eshkol-Wachman notation system was conceived and practised. I would also like to examine how it came to be associated with structures of power, to the point of being used in militarised contexts. Ultimately, I wish to question the ideological implications of their taxonomy of gesture, their attempt at classifying and schematizing the movement of the human body.

This chapter covers an era spanning from the early 1950's to the late 1970's and situates Eshkol's and Wachman's work with contextual references to the early 20th century, which corresponds to the most fruitful years of the cooperation between the two. Between the Declaration of Independence in 1948 and the late 1970's, the young state of Israel was involved in a series of wars with neighbouring countries Lebanon, Syria, Jordan, and Egypt, as well as with the local Palestinian population. These include, in chronological order, the War of Independence (as it is called by Israelis), or the *Nakba* - the "catastrophe" - as it is referred to by the Palestinians (1948-49), The Sinai War (1956), The Six-Day War (1967), The War of Attrition (1968-70) and The Yom Kippur War (1973). Over these decades, Israel's outer borders underwent dramatic change⁶ as the state defined its own (body) image. The tension between the body of the state and the human body as well as the ideology binding them together are an undercurrent in this chapter. With this interconnectedness as a guiding line, I wish to demonstrate: 1) How Eshkol and Wachman's aesthetic attempt to create a system of mapping bodily movement was ideologically linked to the mission of

⁴ Eda Cufer, *Art System and post-WWII Avant-Garde Art*, Springerin Magazine, Issue 1/2011 - L'Internationale

⁵ Eda Cufer, *Art System and post-WWII Avant-Garde Art*, *ibid.*

⁶ The return of the Sinai desert to Egypt in 1978 is marking the end of this process. Nonetheless, another slower, more gradual movement of the borders is still taking place inside the occupied territories of the West Bank.

building the new State of Israel; b) How it is linked to its militarised nature, and c) How it was subsequently used to map out its political territory.

Notation System for the Creation of Dances

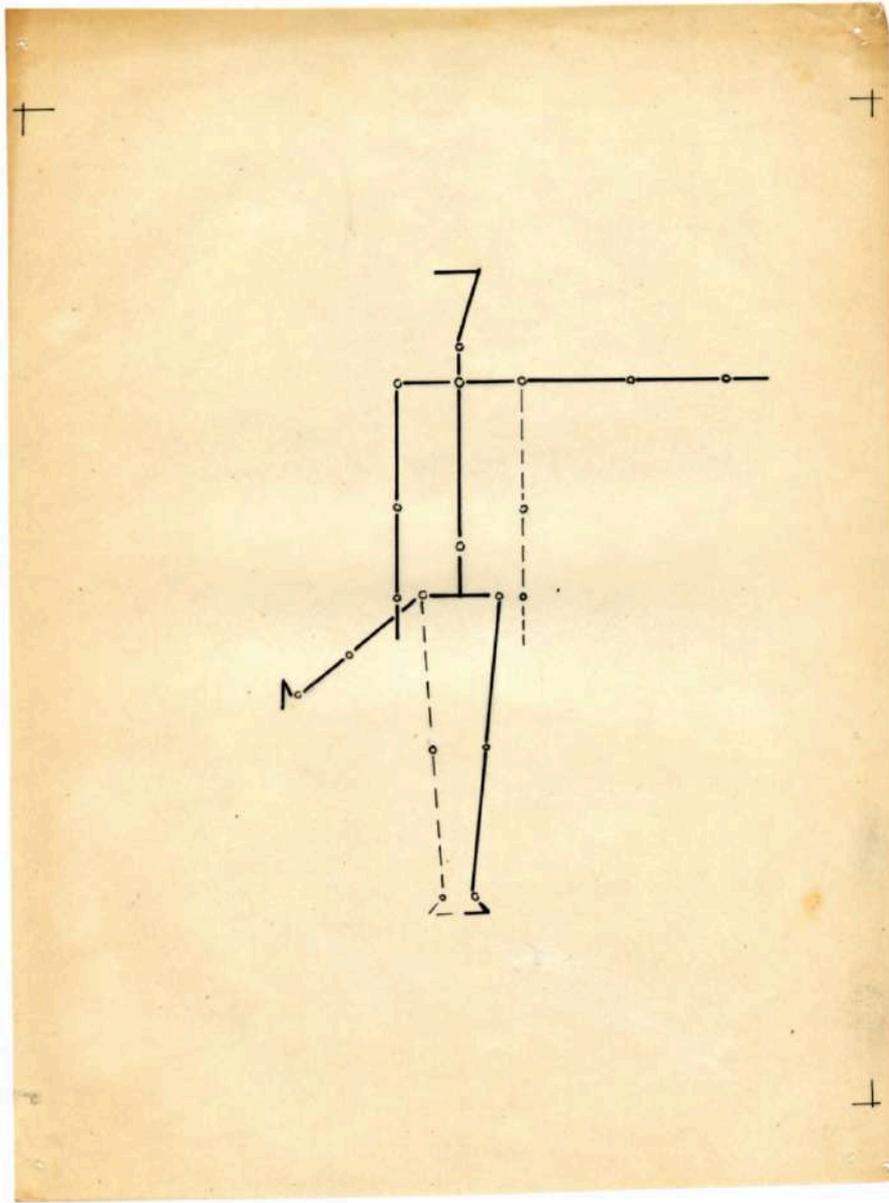
The *Eshkol-Wachman Movement Notation* (EWMN) was first outlined by Noa Eshkol and Avraham Wachman in a book published in 1958 and entitled simply *Movement Notation*. Eshkol was looking for a “theoretical basis which would allow the representation of all movements by means of numerical values”⁷. For Wachman, the movement notation system was intended to serve as a language designed for interaction and communication “based on a set of rules” that are “capable of producing the unpredictable or unplanned, in an infinite and unlimited number of combinations and configurations.”⁸ The EWMN is based on an abstract and schematic figure of the human body - a “man without qualities”⁹ - with joints acting as the connecting points. Eshkol devised the system after noticing that each axis - or body part - connects to the fixed point of the joint and can therefore move within a sphere. Wachman, who had a specific interest in morphology, proposed an added layout system combining the different spheres created by the different body parts. He also outlined an initial index of signs to indicate direction, range, trajectory, duration and speed.¹⁰ On a grid, the different body parts, the body’s weight and direction are registered on a vertical axis, while the horizontal axis allows the division of time into units. A series of simple symbols and numbers can document the exact position, the weight distribution, and the motions of the body parts in space at any given moment.

⁷ Yanai Zvi, *Notation for Liberation of Movement*, Contact Quarterly (Journal), Vol. 7, No. 2, Winter 1982, Focus on Documentation, Northampton, 1982, p.11

⁸ Wachman Avraham in Finkelman Ifat’s, *An Anatomy of Space and Body, The 'Eshkol-Wachman Movement Notation' (EWMN) in the Context of Post-war Architectural Culture*, M.Sc. Thesis, Heb., 2010, p. 82

⁹ Noa Eshkol in Finkelman Ifat, *An Anatomy of Space and Body*, p. 17

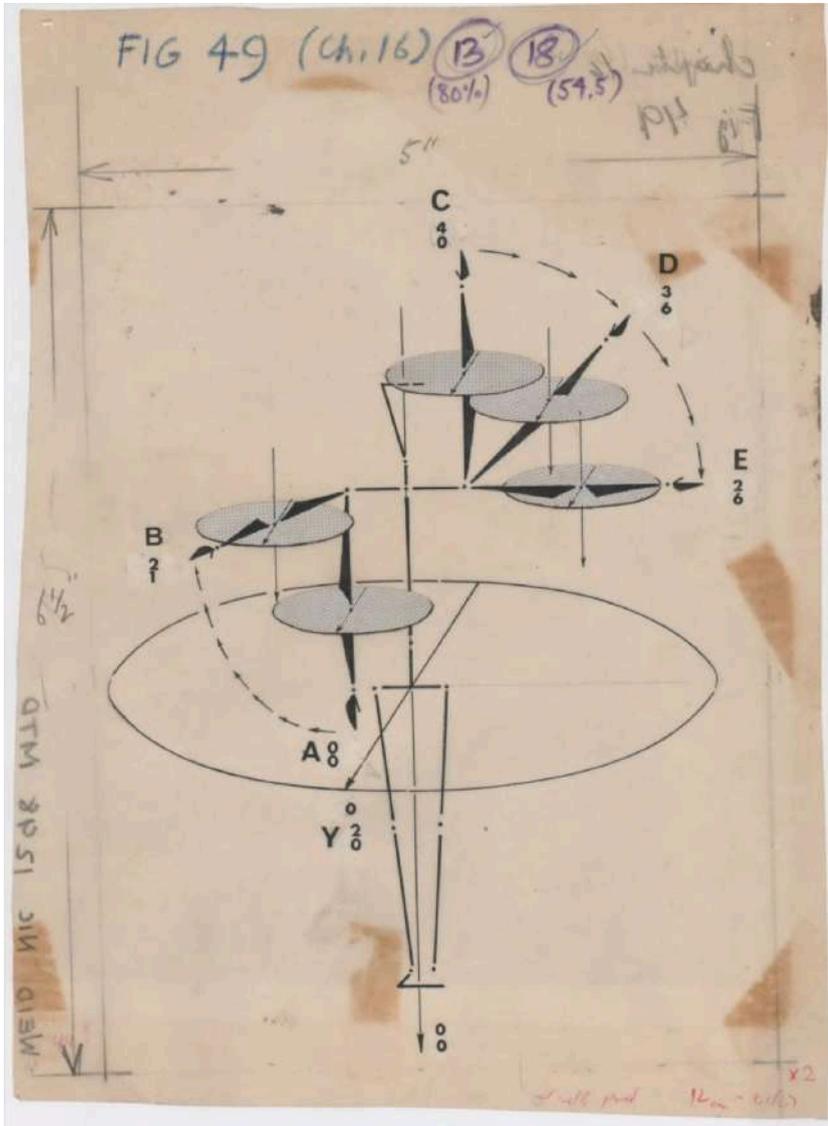
¹⁰ Finkelman Ifat, *An Anatomy of Space and Body*, p. 11



Eshkol herself wrote: “It is a significant fact that despite the great number of names associated with attempts to formulate methods of notation for movement and dance, to this day there exists no serious literature of the dance. That is to say, no body of work composed in notation and generally available.”¹¹ While other movement notations (The Labanotation, The Benesh Movement Notation and others) were created mostly to document and archive existing choreographies staged by their inventors, the Eshkol-Wachman movement notation system was invented in order to create dances. Its primary attempt was to outline the possibilities of the human body, focusing on the connections between the various body parts,

¹¹ Eshkol Noa, Preface, in: *Noa Eshkol, Right Angled Curves (Dance Suite)* The Movement Notation Society & Tel Aviv University, Holon and Tel Aviv, 1975, p. 5–6.

and their simultaneous coordinative movement potential. It generated new radical physical discoveries and allowed for abstract and rationalised thinking about movement, detached from any aesthetic preconception.



Consequently, Eshkol's own dances were first written using movement notation, and only then would her dancers execute them. With no warm-up and no preparation, rehearsals would consist of executing the notes as precisely as possible. Once a month, the group would open their process to others, with intimate performances. Eshkol rejected all forms of stage design, and movement was the sole focus of her investigation. The stage or the studio space remained empty and devoid of any set, while the group of performers wore similar and neutral clothes and moved to the monotonous sound of a metronome. The choreography was often in strict synchronicity, which would momentarily break into individual movement sequences, and

then come back to unified movement. At the end of Eshkol's performances, the performers would simply leave the stage without bowing - an action that in Eshkol's view was at odds with her movement explorations.



Due to its rather simple, functional, pared-down and effective approach, the EWMN can be used to document all types of movement. In parallel to composing and practising her dances, Eshkol tested the system in order to examine this applicability. She and her group issued a series of books in which they resorted to the notation system to record various dance types, from folklore to ballet, martial arts, movement therapy, sports education and training, sign language, and more. Her followers further worked with the system to notate the movement of animals, to diagnose autistic movement patterns in babies, and to help overcome learning disabilities. The EWMN is still taught today at various academic institutions around Israel.

Zionism - The Architecture of the Body

Eshkol was born at Kibbutz Degania Bet in Mandatory Palestine¹² in 1924. Her parents were among the founding members of the Kibbutz, and her father Levi Eshkol would later become Israel's third Prime Minister. After her parents' divorce, Noa and her mother moved to the city of Holon, and Eshkol embarked on her studies of dance and body culture in the neighbouring Tel Aviv. Having studied music from an early age, when studying dance she soon felt the need for a system of dance notation, similar to the one used for music. Her teacher Tille Rössler introduced her to the work of dance artist and theorist Rudolf von Laban, who had developed a dance notation system known as the Labanotation. Following Rössler's advice, Eshkol moved to England in 1946 to attend classes at the Art of Movement Studio founded by Laban in Manchester, and later at a school established by Laban's student, the German dancer, choreographer, and teacher Sigurd Leeder, in London. In 1951, she returned to Holon and began to teach dance at various institutions.

Wachman was born in 1931 in Lublin, Poland, and immigrated to Mandatory Palestine with his parents in his early childhood. He grew up in Tel Aviv, and as a teenager he studied Performing Arts and played the violin. Along with some of Israeli theatre's founding figures, he was a member of the first class of the Cameri Theatre School, where Eshkol taught, and their collaboration began.

¹² Following the fall of the Ottoman Empire, between 1920 and 1948, the mandate to rule over the Palestinian territory was given to Great Britain by the League of Nations, the first intergovernmental organisation responsible for maintaining world peace. During the course of this mandate, and following the Balfour Declaration (1917), the British government promoted the establishment of a national home for Jews, back then a small minority in the region, in Palestine.

Both Eshkol and Wachman were brought up in an environment in which the Utopian socialist ideologies of the Kibbutz movement prevailed. This environment was based on the promotion of equality, communal living and the working of land on one hand, and the modernist visionary mission of building a modern Jewish state on the other. “Wherever the moderns appear with our inventions, we transform the desert into a garden”¹³ wrote the father of modern Zionism Theodore Herzl, in his book *The Jewish State*. One of the main aspirations of the Zionist movement was to heal the Jewish nation through the creation of a new Jewish body; transforming the weak, deformed and exiled body that leant over books into a strong body that owns and plows its land. “At last, we are allowed space for our bodies to live again,”¹⁴ wrote Max Nordau, a physician, writer and Zionist leader, who also coined the term *Muskeljudentum* (Muscle Jews). “Let us take up our oldest traditions; let us once more become deep-chested, sturdy, sharp-eyed men.”¹⁵ Constructing a ‘new body’ also involved the abandoning of old terminologies and aesthetics. The making of this new body image was reflected in the dances the Zionists practised, which corresponded to their different origins and backgrounds, while always giving them a local interpretation. The first newcomers arriving from Russia at the end of the 19th century performed the social dances to which they were used in their homeland. Later on, choreographers immigrating from Eastern and Western Europe brought a professional approach with classic and expressionist aesthetics. Eshkol, on the contrary, was more interested in the functionalities of the human body and its movement rather than in any particular style or any form of expressionism in dance. “The term ‘dance’,” wrote Eshkol and Wachman in the preface to their first book “voices, in every period, a certain range of movements expressing the choice of a composer and dancer and fulfilling the demands of a particular society in a certain epoch”. “Movement”, on the other hand, “includes in its meaning all the possibilities of movement of the human body in their various manifestations.”¹⁶

As constructing the new emancipated body was closely linked to the process of constructing a modern and sovereign state, it also involved the abandoning of old terminologies and

¹³ Herzl Theodore, *Der Judenstaat (The Jewish State) 1896*, PDF edition, MidEastWeb, p. 45

¹⁴ Nordau Max Simon, *Zionistische Schriften “II. Kongressrede”* (Cologne and Leipzig; Juedischer Verlag, 1909), 379-380, translation Umland Joshua with the help of Shneer David. Sited in Umland Joshua, *Max Nordau and the Making of Racial Zionism*, University of Colorado Boulder, 2013, p. 5

¹⁵ Nordau Max Simon, *Zionistische Schriften “II. Kongressrede”*, ibid

¹⁶ Eshkol Noa, Wachman Avraham, Introduction, Second draft of *Movement Notation*, type-written and hand-written booklet, 1956, p. 2

aesthetics. Jewish migrants who escaped an increasing hostility towards their communities in Europe brought new approaches and aesthetics to Palestine. The 1920s and 30s saw the planning and construction of Tel-Aviv, also called The White City. It consisted of more than four thousand buildings that were erected by architects following the international style that was developed in Europe between the two world wars. The Bauhaus Movement was thriving, and its ideas of simplicity, functionality, and adaptability captivated the Zionists. The establishment of the state of Israel in 1948 accelerated this process and architectural innovation was at its core. Simultaneously to his cooperation with Eshkol, Wachman graduated from the Faculty of Architecture and Urban Planning at the Technion - the Israeli Institute of Technology in Haifa, and his dissertation focused on round and orthogonal buildings. He began to teach morphology, one of his main fields of interest, at the same institution. Morphological Architecture, a paradigm developed within the walls of the Technion, increasingly gained national and international interest. It strived to include three-dimensional patterns extracted from the molecular world within the architectural practice. Architect and scholar Ifat Finkelman, who conducted an extensive interview with Wachman, reports that while some of the professors at the Technion were interested in morphology to determine the final and defined shape of a building, Wachman and some other colleagues were interested in a general blurring of the boundaries of the field of architecture with other fields of knowledge. They prioritised the dynamic interconnectedness between the humans and the spaces they inhabit, detached from any defined aesthetics. As Finkelman points out, the invention of the EWMN was instrumental for Wachman's vision and innovative approach within his own field of research. It derived the focus from the "fixed, the stable and the known aspects of architecture towards its shifting qualities."¹⁷

Movement Notations as Templates of Body Politics

The encounter between the two thinkers revealed that Eshkol's quest to schematise the movement of the body and Wachman's functional approach to shape and space could be complementary. For Iris Lana, a dance researcher, lecturer, and director of archival projects in the field of dance in Israel, practising the EWMN allowed for "a form of total submission which liberates the body on one hand and polices it on the other".¹⁸ It offers a decoded language that needs to be executed, mostly collectively, following a very precise script. Its

¹⁷ Finkelman Ifat, *An Anatomy of Space and Body*, p. 2

¹⁸ Online Interview conducted with Iris Lana on the 10/07/2021

very strict protocol-like quality and the standardised aesthetics it offers resonate, I would suggest, with the local Israeli body politic, and with processes of narrative and identity building that took place in the newly established state. Its development cannot be dissociated from the specific social and political order out of which it emerged. “Dance, like science, participates in a large web of ethical, social and political entanglements, while also constructing models of the moving body,”¹⁹ writes dance historian Susanne Franco. Historically, dance practitioners have often found themselves resisting but also complying with structures of social, economic and political power through their artistic practice. Several Western dance practitioners resorted to the creation of movement notations, which often became embedded in larger societal transitions and complicit within structures of political and class power.

The earliest movement notation was commissioned for the court of Louis XIV to help the king memorise his famous dance performances. It was published in 1700 by the king’s *maître de danse* Raoul-Auger Feuillet in a book titled *Chorégraphie*²⁰ (Writing Dance). The Beauchamp-Feuillet²¹ Notation documented a set of basic physical positions laid out on top of a diagram documenting the dancers’ movements in space. It formed the fundamentals of the construction of ballet as we know it today. As argued by Gay Morris and Jens Richard Giersdorf, this notation attempted to mirror the manners of the upper-class elite through the process of registration of movement. It established “terminology and practice of choreography [that] functioned as a textual organisation that works primarily to reinforce a particular kind of order in society.”²² Over the course of two centuries, according to Morris and Giersdorf, it gradually widened the gap between social dance and theatrical dance. Moreover, the growing codification and theatricalization of the dancing body on the aristocratic social stage set an example for the emerging bourgeois social class to emulate.

In the 20th century, when ballet had become a status symbol and the most highbrow form of Western dance, the mathematician Rudolf Benesh introduced The Benesh Movement Notation (BMN) or “Choreology” co-developed in cooperation with his wife Joan Benesh, a

¹⁹ Susanne Franco, *Energy, Eukinetics, and Effort Rudolf Laban’s Vision of Work and Dance*

²⁰ The attempt to document dance outlined in the book paved the path towards the modern use of the term choreography.

²¹ Another *maître de danse* Pierre Beauchamp later claimed to be the original inventor of this notation system.

²² Gay Morris, Jens Richard Giersdorf ed. *Choreographies of 21st Century Wars*, p. 8

soloist with the Sadler's Wells Ballet in London. In 1965, the Benesh Notation inspired the establishment of the Institute of Choreology by the British Minister of the Arts. The institutionalisation of the term has led to the establishment of another more debatable field of "ethno-choreology". While choreology is mostly used to annotate classical or neoclassical choreographies, ethno-choreology focused on folklore and non-western body practices. As such, it has deepened the gap between so-called high and low art in dance, and between professionalism and amateurism. Furthermore, it has contributed to a long colonial tradition of analyses, and to the classification and categorization of foreign and indigenous practices according to Western terms and standards.

The "Labanotation" or "Kinetography", was a notation system outlined by Rudolf von Laban, one of the founding fathers of Expressionist Dance, a modern type of dance that emerged in Europe in the beginning of the twentieth century. This Hungarian-born dance theorist's notation first appeared in print in Berlin in 1928, in a book named *Schriftanz* ("Written Dance"). It is based on a series of abstract geometrical symbols that define the direction and range of the movements as well as their duration and dynamic quality. Within the Weimar Republic, Laban established a network of schools that taught his notation system, and successfully brought together professional and nonprofessional performers around the art of dance. Labanotation "enjoyed wide popularity in the Weimar Republic because its handy and easily reproducible tools simplified the staging of choreography for large groups,"²³ as dance scholar Evelyn Dörr observes. Von Laban remains an ambiguous figure in the eyes of many historians, and suspicions were raised with regard to his adherence to Nazi ideology. When Hitler was sworn in as Chancellor in 1933, Von Laban was appointed as the Director of the Deutsche Tanzbühne (German Dance Theatre). He held this position until 1936 and while in office, was responsible for shaping the face of German dance. One of his biggest artistic achievements, the choreography *Of the Warm Wind and the New Joy*, was supposed to be performed at the Berlin Olympics (1936), deployed by thousands of performers from all over Germany who were taught the movement via the Labanotation. The work was eventually banned by Hitler, who labelled it too intellectual. This 'failure' forced Von Laban to leave Germany and settle in England. During World War II, he applied his notation system to another initiative, this time on the side of the Allied forces, concentrating on maximising industrial efficiency in wartime factories. In his book *Effort* (1947), Von Laban develops his

²³ Evelyn Dörr *Rudolf von Laban: The "Founding Father" of Expressionist Dance*, Dance Chronicle, 26:1, 2006, p.19

project to improve the efficiency of work by optimising motion sequences while still maintaining an acceptable level of worker satisfaction.

The Eshkol-Wachman Movement Notation as a Modernist Project

As for EWMN, it was devised in opposition to Labanotation, which was described as "arbitrary" by Israeli civil servant and author Zvi Yanai, who served as head of Israel's Ministry of Science in the 1990s. According to Yanai, Labanotation "treats movement as a "transition" more or less taken for granted, as though there was one way between two points - the most "natural" one"²⁴. Furthermore, it is "literary" as it attaches verbal terms (strong, light, free, bound, etc.) to symbols that lead to a subjective interpretation of the notation.²⁵ Noa Eshkol, who made her formation partly at the Laban school, criticised this arbitrariness, claiming that the proper notation of movement should rely on the highest level of scientific-like precision and leave no room for subjective reading or interpretation, to be "free of verbal terminology and the emotional charges which accompany it."²⁶ Scientific approach and innovation were also at the heart of the newly established state of Israel; the country itself did not develop organically, but was rather engineered in its entirety within a short period of time. The Zionist project as whole was about decoding the existing paradigms and offering new notes/codes for the emerging state and its people. The Hebrew language itself was re-invented, from the sacred language to a spoken and written language fit for daily use. According to dance historian Ramsay Burt, "with its abstract, formal concerns and its aim of creating a new dance aesthetic, Eshkol's [and Wachman's] project was a modernist one,"²⁷ and "modernism, as an aesthetic form, was for much of the twentieth century associated with ideologies of progress that have become increasingly problematic."²⁸ Modernism did not only dismiss the past but also literally destroyed old and existing structures in order to impose new ones in their stead. In the Israeli context, the famous phrase cited among the Zionists - "A land without a people for a people without a land", dismissed local communities residing in Palestine, an approach which led to the destruction of their habitat and to the killing or eviction of hundreds of thousands of people from their

²⁴ Yanai Zvi, *Notation for Liberation of Movement*, p. 4

²⁵ Yanai Zvi, *Notation for Liberation of Movement*, *ibid*

²⁶ Yanai Zvi, *Notation for Liberation of Movement*, p.11

²⁷ Ramsay Burt, *Living Archives Sharon Lockhart's Collaboration with Noa Eshkol*, in Sharon Lockhart | Noa Eshkol, Sternberg Press, Daniela Zyman, Eva Wilson, Thyssen-Bornemisza ed., Art Contemporary Sternberg Press, November 2012, p. 56

²⁸ Ramsay Burt, *Living Archives*, p. 57

homeland in order to make room for the Jewish people, assuring the demographical superiority of the Jews over the Palestinians that remained. The Israeli project of modernization through the occupation of Palestine also made sure Israelis gained access to a certain global elite. It is no surprise then, that the utopian desire of creating a notation system of universal value has led international researchers to take interest in Eshkol and Wachman's findings so that they were applied in various unexpected contexts. One should also not dismiss the fact that Noa Eshkol was Levi Eshkol's daughter. Her father served as Prime Minister of the young state of Israel from 1963 to 1969, at the time when her work was drawing increased international attention. Wachman on his part became a leading professor in his faculty and later on also served as its dean. Ten years after the publication of their first book, Eshkol and Wachman's research and movement notation was implemented in some of the most innovative scientific projects of their time. While their professional achievements and the validity of their movement notation remain exceptional, I would like to question the intersections between their practice - that emerged from an aesthetic field - and its application in fields related to processes of militarization after the Second World War.

EWMN and its Militarised Applications

The neutral and scientific approach of the EWMN and the very precise simulation of human motion it offers have increasingly gained national and international interest. This was the case when NASA scientists were looking to create the perfect suit that would allow astronauts to move optimally in the outer sphere as part of Project Apollo (1968-1972). The researchers had to look into the perfect engineering equation between different engineering properties of the suit, such as weight, mechanical complexity and leak rate, while simultaneously ensuring maximised mobility. While other parameters could be measured with precise existing equations, NASA researchers were missing “measurement techniques and specifications for suit mobility,”²⁹ as reported by John A. Roebuck, leading engineer and project manager for the Apollo program, in his article titled *A System of Notation and Measurement for Space Suit Mobility Evaluation*. NASA scientists delved into research in humanities and the arts, looking for approaches and measurement techniques related to the movement of the human body. Upon discovering the Eshkol and Wachman movement notation they found it the most useful for this purpose, specifically as it “presented the notion of a unique directional description of

²⁹ John A. Roebuck JR, *A System of Notation and Measurement for Space Suit Mobility Evaluation*, in *Human Factors: The Journal of the Human Factors and Ergonomics Society* Feb. 1968 p. 80

limb position earth-bound conceptions and a spatial coordinate system common to all.”³⁰ In the sketches produced by NASA scientists one could recognise Eshkol and Wachman's way of mapping and notating the human body as well as the same logic of measuring its mobility.

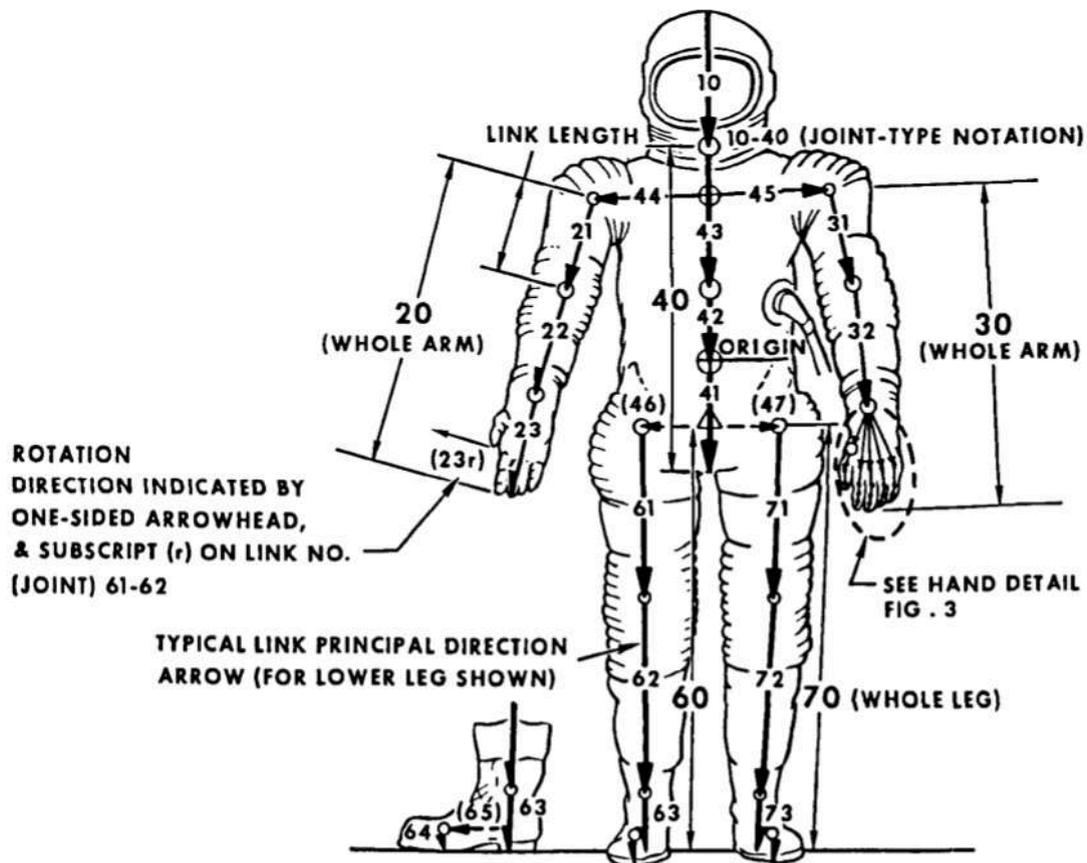


Figure 2. Link diagram and numerical notation system.

Yet the Apollo Project did not emerge in a vacuum. It set out to accomplish the goal of landing a man on the moon in the midst of a global ideological conflict between the United States and the Soviet Union. The United States had already lost a battle to the Soviet Union, which was the first country to send a spaceship to space and to enable a human being to orbit Earth. The space race however, has often been interpreted as a display of technological and strategic power - a way for both superpowers to showcase their military potential. The technologies involved in conquering space were therefore also meant to be translated into warfare. Engineering the launch of spaceships allowed the United States to make instrumental progress and to catch up with the USSR in the development of long-range missile programmes. Furthermore, after World War II the colonial empires began a process of

³⁰ John A. Roebuck JR, *ibid*

dismantling the colonies that had been established throughout the world prior to World War I. Consequently, outer space became a new territory to be conquered - a new frontier in the competition of global powers.³¹ Like a scenario that had already been played out in science fiction, the Apollo project was crucial in making space colonisation part of an increasingly likely future. Moreover, the possibility of translating human motion outside of the atmosphere of the Earth, to which the EWMN contributed, has led, I would argue, to a paradigmatic shift in relation to the body and the very politics of movement. It literally opened up the possibility of man stepping on and eventually settling on and colonising new lands beyond Planet Earth. It is perhaps quite a big leap to think about the direct link between the development of a dance notation system such as the EWMN and the nuclear arms race or the potential colonisation of space, but as Gay Morris and Jens Richard Giersdorf remind us, systematic neutrality does not exist and choreography “can enable, or at least be complicit with colonial, postcolonial, and economically globalizing projects, as much as it can resist such projects.”³²

In the late 1960's, Eshkol and Wachman were directly involved in another ground-breaking project. Upon invitation by the Austrian-American scientist Heinz von Foerster, Eshkol (as visiting research professor) and Wachman (as consultant), together with a group of Eshkol's dancers, worked on the Notation Movement project within the Biological Computer Laboratory (BCL) at the University of Illinois. Founded by Von Foerster with support from the Pentagon, and funded by the US Air Force, the US Navy, and the U.S. National Aeronautics and Space Administration among others, this laboratory examined the possibility to implement biological processes within computing systems. Von Foerster, who worked in the field of cybernetics, was interested in the re-conception of this science within the limits of complexity and unpredictability. The success of the EWMN in mapping both the movement of humans and that of animals was of obvious value for him. Applying his ideas to complex systems “enabled von Foerster to use and extend the [EWM] notation as a control unit for the movement of autonomous robots.”³³ During this research, which was funded by the US Army's research department, a computer program was written based on the EWMN. In

³¹ Before discovering the Americas, their potential existence was already thought of as an outer space and their potential inhabitants were thought of as aliens. It is also not a surprise that the ESA's (European Space Agency) space lab is called Columbus hinting to the new extra-terrestrial frontiers to be explored and conquered

³² Gay Morris, Jens Richard Giersdorf ed. *Choreographies of 21st Century Wars*, p.7-8

³³ Joana Chicau, <https://joanachicau.x-temporary.org/> accessed last on 4 Oct. 2022

addition, the researchers developed numerous implementations that exemplified how an algorithm could be used to generate actual movement based on symbolic commands. The final report of the project, in which Eshkol and Wachman outlined all the basics of their movement notation, concludes that the EWMN “would be of considerable value [...] by its immediate applicability to the construction of anthropomorphic automata which are to perform in environments inaccessible or hostile to a human operator, and with which communication is maintained via channels of capacities orders of magnitude below those needed for continuous surveillance and without the benefits inherent in the redundancies of symbolic discourse.”³⁴ Such early experimentations paved the way, I would argue, for the use of automated remote-controlled devices in military and surveillance contexts. Recent implementation of such technologies in the battlefield have further complexified the interconnection between choreography and the military. Operators now sit at screens, remotely directing the movement and the performance of machines on hostile terrain.

Although Von Foerster was unwilling to link his research to military work and now represents the “soft” side of cybernetics, his work entailed an ethical dimension that could not simply be overlooked. Information system researchers Magnus Ramage and Chris Bissell contend that cyberneticists have a moral responsibility towards the military implications of their work. For Ramage and Bissell, “An attempt to ignore the [these] ethical concerns all too often leads to the privileging of those in positions of power.”³⁵ There are no clear records as to whether Eshkol and Wachman were busy with the ambiguous, often militarised, nature of the field of cybernetics in general and the BCL in particular. One can wonder why they never publicly mentioned or discussed their contribution to the Apollo project. To them, the application of their finding as part of the Apollo project was rather marginal.³⁶ This in itself is rather surprising, given the importance of the Apollo project from a scientific point of view and since it is the third most expensive space program in history. To Eshkol and Wachman, the movement notation was a work in progress meant to be implemented and tested in various contexts. But can these implementations of the EWMN be observed separately from the

³⁴ *Notation of Movement, Final Report*, Covering the Period 1 March 1968 - 31 August 1969, Grant DA-ARO-D-31-124-G998, Sponsored by U.S. Army Office-Durham, Department of Electrical Engineering, University of Illinois, Urbana, Illinois, 61801, 15 Feb. 1970, Preface, p. V

³⁵ Ramage, Magnus and Bissell, Christopher (2015), *Cyberneticist at war and peace: wrestling with ethical dilemmas of information*. In: *The Difference That Makes a Difference (DTMD 2015)*, Vienna University of Technology, Austria 5 Jun 2015, p. 4

³⁶ No archival records are found in Noa Eshkol’s Archive that could indicate any contract or economic engagement between NASA and Eshkol and Wachman as indicated to me by Michal Shoshani, the director of Noa Eshkol’s Archive in Holon.

larger social and political context of the projects within which they were implemented? And even if unbeknownst to them (which might be the case in the Apollo project), how should an artist or a researcher react when discovering their findings were instrumentalized for purposes they had never envisioned?

“The war and the military always played an ambiguous role in Eshkol’s work,”³⁷ writer and curator Eva Wilson points out. One of Eshkol’s greatest supporters throughout her life was Shalhevet Freier. After the establishment of the State of Israel, he led the Mossad’s operations in France and was responsible for the implementation of a nuclear pact between the two countries. Later he was appointed by David Ben Gurion, then Israeli Prime Minister and Minister of Defence, to take over the Ministry of Defence’s Department of Planning and Research. This institution, later known as Rafael, remains to this day one of the main weapons manufacturers in Israel. Freier also served as the Chairman of the Israeli Atomic Energy Committee in the 1980’s. As a big supporter of experimentation at the intersection between the sciences and the arts, he was instrumental in the international dissemination of Eshkol and Wachman’s book and also supported Eshkol’s group activities abroad. Consequently, it is impossible to separate Eshkol and Wachman’s work from the ever-militarised Israeli society.

Representatives of the Israeli Defence Forces (IDF) were also interested in their findings. Michal Shoshani, the director of Noa Eshkol’s Archive in Holon, recalls a series of meetings between Eshkol and a Brigadier General from the Israeli Air Force, in which the two discussed the possibilities of the EWMN to be used for the analysis of documented aerial battles. Neomi Polani, a dancer in Eshkol’s group in the mid-1950’s, later became the artistic director of the first Israeli army troops. She choreographed and set the tone for all the army’s cultural activities performed for the Israeli soldiers during their service.

Movement Notation as a Template for Documenting the Dances of the Othered

Israel’s history as such is deeply embroiled in militarised conflicts, through which the country was also able to practise its colonial abilities. As religion historian Daniel Boyarin points out,

³⁷ Eva Wilson *Une Espèce de Sympathie Eshkol’s Spheres and Lockhart’s Loxodromes*, in Sharon Lockhart | Noa Eshkol, p. 63

the ultimate "emancipation" of the Jewish people is "functionally akin to colonisation."³⁸ As an outcome of the Six-Day War in 1967, Israel's territory expanded tremendously, leading to the occupation of the Gaza Strip, the Golan Heights, the West Bank and the Sinai Desert, the latter being the only territory to be eventually later returned to Egypt.³⁹ In 1974, Eshkol's group released one of their notation books, this time notating twenty four Palestinian Dabke dances as well as Israeli folk dances that appropriated this folklore. The dances were collected by Eshkol's dancer Shmuel Seidel, who travelled between Palestinian villages and notated the different versions of Dabke. His notations were then brought to the group's studio in Holon and practised by the other dancers to assess the precision of their notation. "Our hope," wrote Eshkol in the preface of *Debka: Arab and Israeli Folk Dance*, the book that compiled their findings, "is that the present collection will go some way towards preserving a record of the traditional dance style of a culture which is in grave danger of disappearing, as social circumstances change and technological advances reach the Arab villages."⁴⁰ While avoiding the very circumstances imposed by the State of Israel and its active part in that same disappearance, she dismissed the imprecise work of anthropologists and ethnologists who "use such excessively generalised terms as "clapping", "stamping", "waving arms", or "swaying hips", and try to convey movement qualities by vague expressions like "soft" or "wild"."⁴¹ Instead she assured "that the formal character of the [Dabke] dances and the qualities inseparable from the form are in fact preserved."⁴² The detailed documentation of all dimensions of life and nature is a process deeply embedded in the colonial project. "The anthropologist who conducts fieldwork in a colonial setting provides that documentation of differences which functions to support continued subjugation of the group he/[she] studies,"⁴³ wrote Architect and Professor Diane Lewis around the same years. By applying the movement notation - in Eshkol's view a more precise methodology than the ones used by anthropologists and ethnologists - to annotate the dances of the indigenous community in Palestine, the EWMN played a role not only in the way the movement of the Palestinian

³⁸ Daniel Boyarin, *The Colonial Drag: Zionism, Gender, Mimicry*, in *The Pre-occupation of Postcolonial Studies* Fawzia Afzal-Khan, Kalpana Seshadri-Crooks ed. Duke University Press, Durham and London, 2000, p. 238

³⁹ The Israeli disengagement from the Gaza Strip took place in 2005, but Israel is still de facto controlling all aspects of life of the Palestinian population residing there.

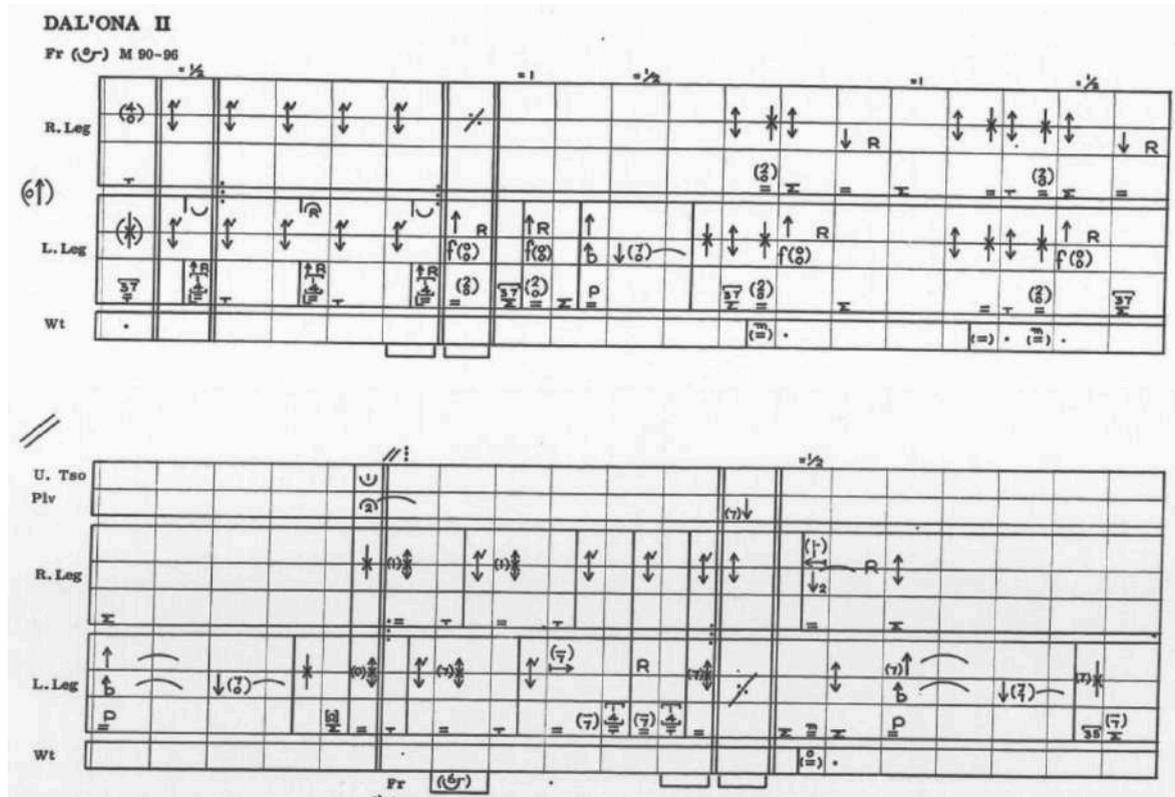
⁴⁰ Noa Eshkol, *Debka: Arab and Israeli Folk Dance*, Holon and Tel Aviv: The Movement Notation Society and Tel Aviv University, 1974, p. 5

⁴¹ Noa Eshkol, *Debka*, ibid

⁴² Noa Eshkol, *Debka*, ibid

⁴³ Lewis Diane, *Anthropology and Colonialism*, in *Current Anthropology* Vol. 14, No. 5, December 1973, p. 584

bodies was documented and analysed, but also in how it was subsequently controlled and colonised.



Ironically, as Eshkol herself remarked, the Yom Kippur War in 1973, during which a coalition of Arab countries attempted to invade Israel,⁴⁴ interrupted the process of working on this book. Shmuel Seidel was called to service on the Syrian front to fight against the same people whose dances he was notating. As Eshkol feared of losing Seidel to a war to which she objected and as she felt incapable of composing dances, another practice emerged. This was a sudden turning point in Eshkol's professional trajectory and career. From that day on and for over thirty years, Eshkol produced over 1800 wall carpets made from pieces of fabric following a strict set of rules: the pieces were never purchased, only found, they were used without alterations and never cut, none of the fabric patterns included animal or human

⁴⁴ In the early stages of the Yom Kippur War, when Israel was fearing to lose due to the surprise attack from the neighbouring Arab countries, the then Israeli minister of defence Moshe Dayan proposed to the then prime minister Golda Meir to check the possibility of launching an atom bomb against the Arab armies. Shalhevet Frier was called to the office to discuss the consequences of this option. The discussion eventually didn't take place as Golda Meir refused this option. In 1977, during the discussions leading to the peace agreements between Israel and Egypt, when questioned about the reasons for the Egyptian army to abort the attack on Israel during the Yom Kippur War, one of the members of the Egyptian delegation mentioned "Don't think that we don't know ... You have an atom bomb".

figures and no prioritisation of forms or colours was allowed. These pure creations of compositions sewed onto fabric became the choreographer's main occupation. She gradually stopped most of her international activity and continued working at her home studio in Holon with a small core group of followers that stayed by her side. Until her death, she remained isolated from institutions. She concentrated on the revision and preservation of the EWMN and became increasingly protective about its alteration or distribution.

Defining the 'Body Image' of the State

As opposed to the feeling of victory and general euphoria prevailing in Israeli society following the Six-Day War, the Yom Kippur War that endangered the entire Zionist project was followed by major mistrust and criticism towards the Israeli government. Israeli citizens reproached their leaders for not being able to predict the attack from the Arab allied forces. Perhaps it is this disenchantment that also led to a new endeavour in Wachman's work. Ten years after the occupation of the West Bank, when the Israeli settlements project was still in its first steps, Wachman cooperated with Prime Minister Yitzhak Rabin's Security Advisor, Ariel Sharon, in the creation of the *Double-Column Plan*. The plan - which Wachman believed to pave the way for the "restoration of the Zionist consciousness"⁴⁵ - was aimed at countering the strategically weak geography and dispersion of the Israeli population in the middle of the country, which at the time was no wider than a thin ten-kilometre "column" along the Mediterranean Sea. Wachman saw the occupation of the West Bank as an opportunity to better secure the Israeli territory by creating another "column" of Israeli cities and settlements along the Jordanian border. According to Wachman, nicknamed "the architect of dance notation"⁴⁶ by Eyal Weizman in his work "Hollow Land", blocks of settlements were to be created, connecting smaller rural units with larger urban industrial ones. It also stressed the development of road networks and sought to isolate the mountain areas populated by Palestinians by inserting Israeli traffic corridors that cut across the Palestinian transportation routes.⁴⁷ The plan promoted a one-sided solution and urged the Israeli authorities to "take a stand, prepare a comprehensive plan and dictate a geopolitical solution."⁴⁸ Wachman believed that only unconditional steps that do "not depend in advance on the consent of the other

⁴⁵ The Double Column Association Booklet, March 1990, p. 15

⁴⁶ Weizman Eyal, *Hollow Land, Israel's Architecture of Occupation*, Verso, London, New York 2007 p. 80

⁴⁷ Weizman Eyal, *Hollow Land*, p. 81

⁴⁸ The Double Column Association Booklet, p. 7

side⁴⁹ (i.e. the Palestinians), could release Israel from its doomed choreography of violence. The Double-Column Plan was not accepted by Rabin but Ariel Sharon, who was appointed that same year as Minister of Agriculture, actively promoted the formation of Israeli settlements in the West Bank. The Double-Column Plan was and still is continuously referred to as the best plan ever designed for the proper securitization of the State of Israel.⁵⁰ In the late 1980s, just before the Oslo Accords, its proponents, including Wachman, founded an association to implement its agenda. The Oslo Accords (1993-1995) *de facto* fractured the Palestinian territory by endorsing the spread of the already-existing Israeli settlements and the presence of thousands of Israeli settlers on Palestinian land. This same fractionalization was at the heart of the Double-Column Plan as it proposed “a network superimposed upon another, the pr-existing living Palestinian spaces. (...) to split and paralyze the Palestinian one. The result would be several isolated Palestinian cantons, each around a major city, with the connections controlled by Israel.”⁵¹



⁴⁹ The Double Column Association Booklet, p. 7-8

⁵⁰ See for example an article by Amir Yosi, *Perception of Settlement - The Double Column Plan*, Jokopost Online Magazine, <https://jokopost.com/thoughts/36355/>, 21. Jan. 2022, accessed last 8 Mar. 2022 or article by Prof. Haas Elisha, *Strategic Political and Military Thinking Necessitates Strengthening the New Settlement of Eviatar*, <https://bit.ly/3MvGOXs>, Mida Online Magazine, 22 Jun. 2021, accessed last 8 Mar. 2022.

⁵¹ Weizman Eyal, *Hollow Land*, p. 81

In an article entitled *Israel Must Draw Lines for a Future*, published in the Los Angeles Times in 1988, Wachman hinted at the interconnectedness of his practice of mapping the movement of the human body and his architectural practice when mapping the territory of the State of Israel as part of his Double-Column Plan. “Moral strength,” he wrote, “will no longer work without definite territorial clarity. Israelis, especially the young generation, must have a ‘body image’ of their land,”⁵² provoking an almost pathological relation of (young) Israelis towards their own (incomplete) body of territory. In a morphological analysis of the “solution” Wachman proposed schemes of uni-column, double-column and multi-column examples claiming that the double or multi-column structures “have higher degree of resilience and are superior in terms of interactions within the tissue during peacetime, and are more resistant to the danger of detachment in wartime.”⁵³ The morphologist whose detailed examinations had led to the creation of one of the most celebrated movement notation systems, was now analyzing the stability of the Israeli state and presenting a new solution for its - in his eyes - incomplete body, leading to the fractured movement of Palestinian population through a territorial divide. Wachman moved from a very concrete notation system for dance, exploited in militarised contexts, to a different kind of grammar or notation system which was supposed to restructure the state of Israel and to create its perfect body politic. Through the construction of a more solid territorial grip Wachman hoped to counter the moral and economic deterioration which had, in his opinion, taken over Israeli society. He also hoped to bring new sense to the Zionist movement which, in his view, had lost its direction.

Blurry Manifestos

“We live within political systems that have an increasing interest in physical movement, or perhaps just an increasingly effective control over it,”⁵⁴ writes Israeli political theorist Hagar Kotef. In her book *Movement and The Ordering of Freedom* she focuses on movement not only as a concept for the liberation and emancipation of a modern subject but also a concept through which control of one's rights can be limited or taken away completely. The taxonomy

⁵² Avraham Wachman, *Israel Must Draw Lines for a Future*, Los Angeles Times, 17 Apr. 1988

⁵³ Avraham Wachman, *The Double-Column Plan, An Outline for a Territorial Solution and an Overall Physical Plan*, Horizons in Geography, Vol. 3, The University of Haifa, 1977 p. 48-49

⁵⁴ Hagar Kotef, *Movement and the Ordering of Freedom, On Liberal Governance of Mobility*, Duke University Press, Durham and London, 2015, p. 1

of gesture in human mobility, as demonstrated within the EWMN, has not only contributed to the modernist and contemporary aspiration of optimization of human (Project Apollo) and non-human (BCL) mobility. Wachman, its co-creator, also attempted to contribute with his expertise to the reshaping of his state's occupation apparatus, which would consequently lead to the limitation of people's freedom of movement. Moreover, these extra-choreographic articulations of the EWMN attempted in one way or another to intervene in a certain vision of the future. But exactly what type of future do they lead us to envision?

The genuine attempt by Eshkol and Wachman to map out bodily movement within an aesthetic field of dance has created a template or a tool that can be used and further developed for militarised purposes. Jacques Rancière's concept of "the distribution of the sensible" is grounded on such a porosity between the 'aesthetic' avant-garde and the 'political' avant-garde. For him, "the notion of the avant-garde defines the type of subject suitable to the modernist vision and appropriate, according to this vision, for connecting the aesthetic to the political."⁵⁵ It is at work when ground-breaking ideas transcend the artistic field and actively operate and make a shift in the political sphere through innovation. As author and poet Hans Magnus Enzensberger reminds us, *avant-garde*, the very concept that connects to ground-breaking experimental, radical, or unorthodox thinking within the arts, is derived from a French term referring particularly to that part of an army that goes ahead of the rest - the main body and the *arrière-garde*. It has emerged historically in relation to revolutionary movements and ideologies and often expresses an aspiration to freedom gained through resistance. But, as Enzensberger points out "it remains vague and blurry just what freedom the manifestos of the artistic avant-garde have in mind and what the world *revolution*, frequently though it may appear in them, is supposed to mean there."⁵⁶ Modern warfare is a laboratory where aesthetically innovative tools are continuously appropriated for the creation of innovative technologies used for new forms of military experimentations.⁵⁷ The aforementioned examples also suggest that body-related knowledge is much more significant to the development of modern warfare than the classical historical readings would have us think. Wars and conflicts have always been the forefront hubs for some of the most

⁵⁵ Jacques Rancière, *The Politics of Aesthetics, The Distribution of the Sensible*, Bloomsbury Publishing, London, p. 29-30

⁵⁶ Hans Magnus Enzensberger, *The Aporias of the Avant-Garde*, in *The Consciousness Industry; On Literature, Politics and the Media*, ed. Michael Roloff in 1974. p. 289

⁵⁷ Anders Engberg-Pedersen, *Technologies of Experience: Harun Farocki's Serious Games and Military Aesthetics*, *Boundary 2*, Volume 44, Issue 4, Duke University Press Durham 2017, p. 162

groundbreaking inventions, both constructive as well as destructive, and it seems that it is through the arts - literature, music, fine arts and why not choreography - that some of these tools are imagined and at times actualized.