

Chapter 3 - Neuroweapons: 1919-1945

Introduction to Neuroweapons

In the following section I cover subjects not usually covered in academic literature related to Neuroweapons or Information Warfare. I do not discuss American or Western developments in these areas as this area is well covered in Krishnan 2016. I do cover below the Nazi and Soviet roots of this technology and the general early history of the development of these weapons from the 1910s.

McCreight defines Neuroweapons as:

...the claim is made that neuroweaponry encompasses all forms of interlinked cybernetic, neurological, and advanced biotech systems, along with the use of synthetic biological formulations and merged physiobiological and chemical scientific arrangements, designed expressly for offensive use against human beings. Neuroweapons are intended to influence, direct, weaken, suppress, or neutralize human thought, brainwave functions, perception, interpretation, and behaviors to the extent that the target of such weaponry is either temporarily or permanently disabled, mentally compromised, or unable to function normally. (McCreight 2015, 111-112)

Nørgaard & Linden-Vørnle explain Neuroweapons as:

Neuroweapons include any kind of neurotechnological agent, drug, or device designed to either enhance or deter the cognitive performance of warfighters and target intelligence and command structures as both non-kinetic [non-lethal] and kinetic [lethal, violent] weapons.
(Nørgaard & Linden-Vørnle 2021)

With the creation of neurological based and cybernetic based weapons systems we now encounter a situation where the Battlespace extends beyond a set environment on the outside of a biological entity, but also includes an individuals mind:

“The Department of Defense defines a “battlespace” as “. . . the environment, factors, and conditions which must be understood to successfully apply combat power, protect the force, or complete the mission. This includes the air, land, sea, space, and the included enemy and friendly forces, facilities, weather, terrain, the electromagnetic spectrum, and information environment within the operational areas and areas of interest.” (McCreight 2015, 116-117)

While most scholars write of Neurological Weapons as being a late development in warfare, it's actual origins starts in the scientific research sponsored during World War I and II.

The secrecy involved in the development of neuroweapons technology remains a big hurdle to those trying to understand this technology, as noted by the academic researcher in this area Armin Krishnan, who has no etic knowledge in the DOD or IC, in his book based on open source material on Neuroweapons:

“A researcher of neuroweapons not only has to deal with the issue that official information is unavailable, but furthermore with the problem of outright disinformation. Steve Aftergood has pointed out that Cold War secrecy systems such as Special Access Programs (SAPs) ‘authorizes defense contractors to employ cover stories to disguise their activities. The only condition is that cover stories must be believable.’ (Krishnan 2016, 116)

Even in such open societies as the United States and Great Britain which have developed Neuroweapons since at least the end of World War II little is publicly available in terms of the development of these programs. The Nazis are credited with developing their own Neuroweapons during the 1930s and during World War II. The Wehrmacht through it's Naval Intelligence program developed a proto-Remote Viewing program and the Nazi SS research institute, Ahnenerbe, is credited with developing Neuroweapons (Kernbach 2013, 6) which was subsequently taken to the United States, Great Britain and back to the Soviet Union. The Soviets fell behind the west in terms of Neuroweapons development after 1937 when Stalin banned such research, at least in terms of public research, this was also during the Stalinist purges of the Soviet Military just before the war, which itself may have been a Nazi Information Operation. The United States CIA developed neuroweapons under the code name 'MK-Ultra' during the 1950s through the importation of Nazi scientists under 'Project Paperclip'. MK-Ultra was a follow on project to an earlier project known as 'Project Artichoke' which used drugs to induce confessions during interrogation, based in Germany after the war and using German scientists. In these interrogations they used LSD and mescaline to induce confessions. Other countries involved in early 'remote influencing' technology such as Neuroweapons were Italy through Cazzamali in 1925 and Spain through Robles in 1931. One will notice that all these countries eventually embraced totalitarian regimes. Neuroweapons seems perfectly aligned with totalitarian understandings as noted by Krishnan:

“In contrast, the kind of warfare that has been practiced by totalitarian regimes in the twentieth century and that could be much refined by insights gained from neuroscience is following a completely different pattern for conducting hostilities:

- Neurowarfare is likely to extend over many decades with the distinction between peace and war becoming not just blurred, but meaningless;
- Neurowarfare primarily targets an adversary's minds and ultimately seeks to fundamentally alter the adversary's consciousness until the adversary perceives the world the same way as the sponsors of neurowarfare—the aim is to cognitively assimilate other societies.

- Hostilities are carried out by proxies in a mostly covert, indirect manner and will generally not even amount to violence- much of it will be merely IW [information warfare] or propaganda in combination with other techniques of covert subversion, including espionage, sabotage and the use of “agents of influence”;
- Populations and decision-makers are the main targets in neurowarfare and populations are also used as new WMD for destroying an enemy state through the calculated psychological instigation of internal chaos- no international rules exist or are observed in the new “information-psychological” combat;” (Krishnan 2016, 193)

Information Warfare (IW) is the main motive behind neuroweaponry. IW is applied to both individuals and collectively. So it is not surprising that the East German ‘Stasi’ developed a plan, which may have been taken from the US COINTELPRO against anti-war activists in the 1960s and 70s, which was based on British tactics to combat anti-colonial movements, when they developed the individually targeted Zertsetzung program:

“[Zertsetzung is] an operational method of the Ministry for Security of State for the effective fight against subversive activities. With Zersetzung, across different operational political activities, one gains influence over hostile and negative persons, in particular over that which is hostile and negative in the dispositions and beliefs, in such a way that there would be shaken off and changed little by little, and, if applicable, the contradictions and differences between the hostile and negative forces would be provoked, exploited, and reinforced. The goal of Zersetzung is the fragmentation, paralysis, disorganization, and isolation of hostile and negative forces, in order to impede thereby, in a preventive manner, the hostile and negative doings, to limit them in large part, or to totally avert them, and if applicable to prepare grounds for a political and ideological reestablishment. (Suckut, 2001, 464)

Neuroweapons against individuals is a methodology employed for neutralizing covertly and usually non-lethally any dissident voices as a form of non-obvious warfare (Krishnan 2016, 184). Its use against individuals that pose no violent threat may seem surprising but it is noted by Krishnan that this was used against peace activists in the 1980s in Great Britain by the British Intelligence services (Krishnan 2016, 120), which practised their craft in Northern Ireland such as Operation Clockwork Orange. As one researcher has noted:

The British Defence Equipment Catalogue once carried references to the "Valkyrie System" and "frequency weapons." These were eliminated from the catalogue by request of the British Ministry of Defence in 1983. (Kattenburg, 1987)

It additionally has been cited by Dr. John Hall in his epidemiological studies of targeted individuals by neuroweaponry on ‘whistle blowers’ usually by their own governments and agencies they formally collaborated with:

"While a small number of victims have come forward with convincing evidence of direct harassment from various government agencies, these are mostly whistle-blowers employed by the same agencies and comprised the minority. (Hall 2009, 69)

"The tactics include total inundation of the target at home or wherever they go." (Hall 2009, 72)

The first publicly known use of this technology was during Gulf War I by the United States against Iraqi soldiers:

"According to statements made by captured and deserting Iraqi soldiers, however, the most devastating and demoralizing programming was the first known military use of the new, high-tech, type of subliminal messages referred to as ultra-high-frequency 'silent sounds' or 'silent subliminal'. Although completely silent to the human ear, the negative voice messages placed on the tapes alongside the audible programming by PSY-OPS psychologists were clearly perceived by the subconscious minds of the Iraqi soldiers and the silent messages completely demoralized them and instilled a perpetual feeling of fear and hopelessness in their minds." (Krishnan 2016, 132)

CIA engineer, Dr. Robert Duncan, who worked on these projects has stated that during the war neuroweapon technology was also used to mimic the voices of Iraqi generals to create confusion in Iraqi Command and Control by giving conflicting orders and repositioning troops into US positions for easy capture and defeat. Which is supported by Dr. Begich:

"Light and sound systems like the Sirius or Proteus devices also allow for the input of a users own recorded voice for the maximum effectiveness when the brain is otherwise being moved into an altered state by FFR (Frequency Following Response [Brain entrainment])." (Begich 2006, Ch. 2)

Alarminglly the latest developments in neuroweaponry involves the use of automating the technology through Artificial Intelligence, to this point Krishnan quotes Russian Major-General Vasily Burenko:

...armed violence will assume a secondary position in the future as different forms and methods of adversely influencing a state, a society, or an individual will appear. Such developments include changing the technogenic shell of civilization, making a distinction between living and nonliving things uncertain. Here the real issue is cyber life, he notes. New gene combinations will be designed that do not currently exist, while nanobots will alter the characteristics of an organism. New conflicts will, in Burenok's opinion, not be so much 'wars between people as wars of artificial intellects and the equipment and virtual reality created by this kind of intellect.' (Krishnan 2016, 190-1)

Krishnan remarks:

...biotechnology and nanotechnology could be employed for remaking human life and reshaping human civilization as a method of war. The Russian strategist also seems to believe that military decision-making will be largely delegated to AI, turning warfare in a contest of competing military AI systems. (Krishnan 2016, 191)

As we shall read later the move to automation and cybernetics in war fighting, especially the battle space of mind, took shape in the Soviet Union in the 1980s.

It should be noted that in 1999 there was put forward an initiative in the EU parliament against these technologies:

“Calls for an international convention introducing a global ban on all developments and deployments of weapons which might enable any form of manipulation of human beings.” (European Parliament. Resolution on the Environment, Security and Foreign Policy. A4-0005/99 Jan. 28 1999. EPI159)

While human rights activists and groups have noted:

“The Asian Human Rights Commission released a statement on neuroweapons in 2013: The threat is real...[there are] many indications that brain technology for neuroweapons is scientifically possible. Additionally, some say such technologies have been used systematically against select people in various jurisdictions.” (Krishnan 2016, 206)

Perhaps, even used in Myanmar as one example of a military centric authoritarian regime.

Early Soviet Research in Neuroweapons

The history of Neuroweapons begins around the 1920s in the new Soviet Union. It was an early Soviet scientist that first formulated conceptions of ‘Biological Radio’ or what we would now call Synthetic Telepathy. It was the Soviets and Germans that developed a dual institute: ‘The Brain Institute’ with one located in Berlin and a sister institution in Moscow. As mentioned previously the secret agreement between Soviet Russia and the Reichswehr of the German Government facilitated the exchange of technology from Germany to the Russians and from the Russians to the Germans. Jochen Richter notes about this collaboration:

Of the many interwar connections between Germany and Russia, one of the most unusual - and least explored - is medicine and public health. Between 1922 and 1932, with high-level political support and government funding, Soviet and German physicians and public health specialists collaborated in joint research expeditions, published joint articles, launched a bi-lingual journal, and established joint research institutions. Surprisingly, students of Soviet-German relations have all but ignored this medical collaboration; while historians of science have treated it as political history, an exercise in cultural diplomacy designed to mitigate the impact of the post-war exclusion of both nations from the international science. (Solomon 2006)

The founder of the dual Brain Institute was Oskar Vogt, whose early research was underwritten by the German Armaments producer Krupp. Vogt being a socialist was later replaced by the Nazi regime. After which his new institution again was underwritten by the Krupps[1]. Already, we see an interest in weapons developers in Brain research and underwriting such research from the very beginnings. The Berlin Brain Institute eventually became the Kaiser Wilhelm Institute for Brain Research (Kaiser Institut für Hirnforschung), whose building was financed by the Rockefeller Foundation. Vogt was also interested in hypnotism, a famous collaborator of his was Korbinian Brodmann, of which different areas of the brain are referred to as Brodmann areas.

The early research into telepathy was conducted by several Russian researchers. In 1919 V.M. Bekhterev, who also worked with the Brain Institute in Moscow and a research center in Leningrad, began research into the scientific understanding of telepathy. A Defense Intelligence Agency document from 1978 notes about Bekhterev:

In 1919, V. M. Bekhterev, a noted physiologist at the Institute of Brain Research of the University of Leningrad, began investigations into unusual psychological and physiological effects associated with the hypnotic state, including cases of apparent telepathic experiences. Pavlov had also made reference to unusual abilities sometimes observed in animals and man and was open to such investigations. Bekhterev organized a special group (Commission for the Study of Mental Suggestion) to continue and elaborate on his early work. L. L. Vasil'yev, a research physiologist who joined this institute in 1921, was part of this commission. Vasil'yev's initial work was on effects of magnetic fields on psychological state, eventually he became the prime researcher in the area termed 'mental suggestion'.

In addition to laboratory experiments with hypnotized people, Vasil'yev also began to collect and evaluate naturally occurring incidents (i.e. spontaneous cases) that were suggestive of telepathic processes. He also established contact with researchers in other countries, particularly with the noted French physiologist, Charles Richet, who also conducted psychic experiments with hypnotized people. (DoD, 1978)

L.L. Vasil'yev (Vasiliev) had a very long career later writing publicly about his research decades after his initial inquiries under Bekhterev. The DIA notes regarding his research:

In 1926 Vasil'yev published results of this early research and postulated electromagnetic radiation from the brain as a possible explanation. In the same year a special board was established at the Brain Research Institute to duplicate his findings, but its study did not yield definite results. However, later experiments with a different test person (subject) were stated to be positive and supportive of Vasil'yev's initial observations.

After Bekhterev's death in 1927, little work on telepathy studies occurred. This may have been due to some ambiguous results or possibly to the negative viewpoint on telepathy by the Institute's new director.

In 1932 the Institute was given an assignment to initiate an experimental study of telepathy with the aim of determining, if possible, a physical basis for its explanation. Vasil'yev was selected to direct this investigation. This work continued until 1938 when

World War II interrupted activities. After that, Vasil'yev continued to collect evidence of spontaneous cases and pursued unofficial investigations on his own.

The main orientation of his research during this period was on telepathic induction of specific motor acts, on transmission of visual images from one person (sender) to another (receiver), and remotely induce sleep or awakening in a hypnotized subject. His initial subjects were easily suggestible or hypnotizable hysteric or neurasthenic patients [highly hypnotizable type]. Later, Vasil'yev found certain normal people appeared to have repeatable psychic aptitude without being hypnotized.

Some of these experiments involved attempts at transmission of black or white targets and also specific drawings. Vasil'yev found a few cases where results were far greater than chance expectancy (10^{-7}), and he also reported data showing high correlation between some of the complex drawings used as targets.

His most famous was the long distance experiment between Leningrad and Sevastopol (1700km) which involved 'sending' sleep and awake commands to a subject who had been involved in similar experiments at short distances. (DoD 1978)

It is interesting to note that Vasil'yev was an admirer of a scientist that the Soviets consider the founder of their Space propulsion program and rocket technology, an early Russian Braun.

In his [Vasil'yev] presentations, he often quoted the views of the well-known USSR missile pioneer, K. E. Tsiolkovskiy, who suspected the reality of telepathic phenomena, felt it should be investigated, and saw its potential in future space travel. (DoD 1978)

Tsiolkovskiy, interestingly, draws a connection between telepathy and space travel, which presages the work of Heim and Dubrov, who posited a gravitational effect for psi phenomena and field propulsion. Tsiolkovskiy also had the fascinating ideal that there was an Intelligence that governed humans as 'marionettes, mechanical puppets, machines, movie characters'. This Intelligence is remarkably similar to the ideal of neuroweapons, or 'thought injection', yet decades before any known such system ever existed. Another researcher in telepathy that was influenced by Tsiolkovskiy was Chizhevskiy who we will read about later. Vasiliev also wrote the article "Critical Evaluation of the Hypnogenic Method" concerning the work of Dr. I. F. Tomashevsky on experiments in remote control of the brain.

Also, the early work of B.B. Kazhinsky is of note, one of the few working in this area whose work is not classified as he did his research outside the control of the Soviet Security State. Kazhinsky being a publicly known researcher even had his research in Biological Radio (биологической радиосвязи) popularized at an early point through a fictitious account of his research in the Science Fiction novel, "The Ruler of the World" (Властелин мира: роман Беляева — Википедия) by Alexander Belyaev (1926) which told the story of a German banker who used transcommunication to seize control of a financial empire using what would be later termed "mind control".

The novel's fantastic idea goes back to the research of Hans Berger, who studied the electrical activity of the brain. Many characters of the novel have real prototypes. A remote

prototype of Stirner carries the individual features of A. L. Chizhevsky . The image of Dugov is associated with the trainer Vladimir Leonidovich Durov . The prototype of Kaczynski was Bernard Bernardovich Kazhinsky (the author of the book "Transmission of thoughts. Factors that create the possibility of electromagnetic oscillations radiating out" (1923) and "Biological radio communication in the nervous system" (1926).

Kazhinsky first postulated what he called 'biological radio' for his version of telepathy:

Following the example of P. I. Gulyayev, Doctor of Biological Science, the author refers to the bio-electromagnetic and radiation wave as telepathema finding it to be a very appropriate name. However, the term "telepathy" (inasmuch as it is associated with the wrong and distorted interpretation of the phenomena of thought transference over distances [deep correlation, i.e. Persinger]) should be expressed by a new term such as "biological radio communication", for example, which offers a clearer depiction of the natural capacity of man (and animals) to intercept mental information and sensations (through a physical medium) as one of the brain functions performed by the nerve cells, the biophysical apparatuses. (Kazhinsky, 1963, 14)

In 1922 he began experiments based on his ideals in the Department of Physics at Timiryuzev Agricultural Academy in Moscow:

Investigations in this area were initiated back in 1919. Forty-two years have elapsed since the author developed and publicized his hypothesis of the existence of "ganglions" or "apparatuses" [microtubules, etc] in the central nervous system which are similar to the known electrical systems in structure and purpose: simple current generators, condensers, amplifiers, radio transmitting and receiving devices, etc. That hypothesis, in turn, was based on the assumption that the human thought process is accompanied by phenomena of an electromagnetic nature; that is the emission of electromagnetic waves of a biological origin capable of being transmitted and producing an influence over long distances.

Three years later (1922), following a number of experiments in the department of physics of the Timiryazev Agricultural Academy in Moscow, the author, succeeded in finding in isolated preparations of an animal's nervous system certain nerve elements structurally resembling solenoid loops and paired capacitor plates similar to the well-known elements of the closed Thompson oscillation circuit, a vibrator of discrete currents and electromagnetic waves.

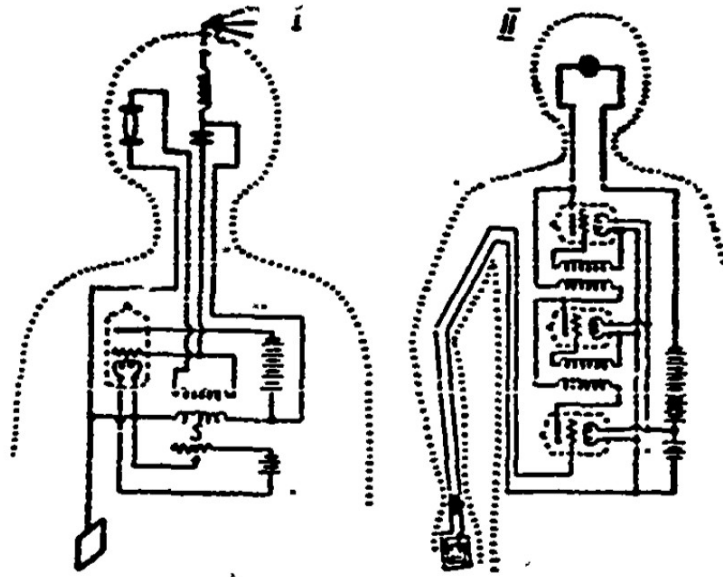


Fig. 9. Initial diagrams of transmitting I and receiving II biological radio stations of the human nervous system

(Kazhinsky 1963)

Also in 1922 Kazhinsky gave a presentation at the 2nd Russian Congress of the Association of Naturalists entitled "Human Thought: Electricity". This was two years before the German scientist Hans Berger created the first known in the west Electroencephalograph (EEG) of the human mind, although Russian researchers in 1914 had performed this on animals. Later, Kazhinsky's research in 1943 postulated a connection to the organ of hearing, perhaps first discovering the key to silent subliminals:

A further study of the physical characteristics of the organ of hearing, from the point of view of the nascent theory of biological radio communications, made it possible (in 1943) to adopt an entirely new viewpoint on that organ as an analyzer of a heretofore unknown stimulant reaching the brain, a bio-electromagnetic wave of acoustical frequency.

An investigation of the structure of the organ of hearing in the light of the new experimental-data suggested (in 1952) a working hypothesis: the eye not only "sees" but also emits into space electromagnetic waves of a certain frequency capable of producing an effect over a distance on a human being (and on animals in general) on whom the gaze is focused. These waves can influence his behavior, induce him to do certain things and generate various emotions, images and thoughts in his mind. Such an emission of electromagnetic waves of a certain frequency by the eye is called a bio-radiation "ray of vision".

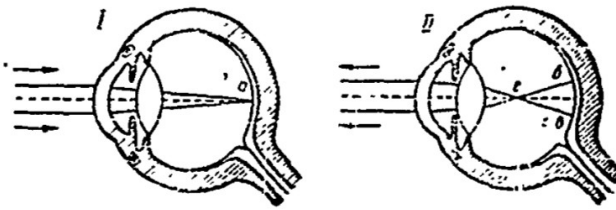


Fig. 14. The organ of vision also has the function of emitting bio-radiation "rays of vision" (working hypothesis):

- I - the figure on the left shows the conventional function of the eye -- the retina and crystalline lens diffract the parallel light rays coming into the eye, directing them at an acute angle to point a. This leaves on the retina a clear image of the visual object in a limited zone of its center which is predominated by cones;
- II - the figure on the right corresponds to the advanced hypothesis. Extending from the wider peripheral zone b-c of the retina (which is shaped like a concave bowl), perpendicularly to the "bowl" surface, are the "rays of vision" b-g and c-g; this peripheral zone of the retina is predominated by rods. At point g they converge as in a focus. They then separate, falling on the internal side of the crystalline lens.

(Kazhinsky 1963)

Kazhinsky ideals of thought transference originated from his work with the Zoologist Durov who conducted experiments with Kazhinsky on dogs to try and remotely give them orders to elicit behaviours. At this time, 1924, he also began studies on sending orders between an emitter and receiver, where the receiver was located in a protected room, the receiver was hypnotized to open up suggestibility.

An account of this research is given below:

In the years 1922-1926 in Moscow, in the Practical Laboratory of Zoopsychology of V. L. Durov of the Main Department of Scientific Institutions of the People's Commissariat of Education, B. B. Kazhinsky conducted a series of experiments. Kazhinsky designed and built a room with more advanced screening ability. The percipient was placed in the chamber, and TV Gurshtein, who hypnotized him, was outside.

Here is how Gurshtein describes some typical results of the first series of observations of 1926:

"The hypnotist, standing close to the door of the chamber, opens the cork of the bottle with strong perfume and asks many suggestive questions like "What do I smell? What smell do you feel?" And so on. The reaction of the percipient after a

relatively large gap: "Flower scent, cologne". The hypnotist takes on the tongue the powder of salt and asks: "What taste do you feel on the tongue?" The reaction of the percipient after a long silence: "Sweet". The hypnotist tries tongue sugar. Percipient reaction - quick response: "Sweet". The hypnotist pours pepper on his tongue. Percipient reaction - answer: "Bitter". The tingling of the hypnotist's left palm is performed. To the question: "What and where do you feel?" - the percipient responds: "The pain ... in the left hand."

A total of 14 such observations were made under conditions when the chamber room was shielded (five times) and not shielded (nine times). The results in nine cases did not contradict the electromagnetic hypothesis, in three cases they disproved it, in two cases they turned out to be uncertain.

Kazhinsky has been studying the phenomena of telepathy for nearly forty years. In the experiments of 1936 conducted by TV Gurshtein together with L. A. Vodolazsky, a room made by Leonid Aleksandrovich with even higher screening capabilities was used.

Important methodological innovations were introduced into the experiment: mental suggestion was transmitted by Gurshtein from another room, while he did not know whether the door of the chamber was closed or open (that is, whether it shields or not). The assistant, who was under the hypnotized subject, did not know the time and nature of the mental impact, that is, the task that the subject had to mentally perceive and perform.

The task concerned the performance of various movements: raising a hand or a leg, clenching a hand into a fist, etc. Of the ten mental suggestions, their fulfillment or non-fulfillment did not contradict the electromagnetic hypothesis in nine cases and only in one case the subject with the open door of the shielded chamber did not exactly fulfill suggestion.

Similar works, but at a somewhat better level of methodological and technical support, were carried out in 1932–1937 in Leningrad by Professor L. L. Vasiliev. In 1932, the Brain Institute V. M. Bekhterev "was assigned the task of starting an experimental study of telepathy with the aim, if possible, of clarifying its physical nature."

Scientific research leadership was entrusted to L. L. Vasiliev. He worked at the Brain Institute since the fall of 1921 and was directly involved in the research of telepathic phenomena conducted by the Institute's Director Academician Bekhterev. After his death in 1927, Vasilyev continued this work on his own initiative, and in 1932 he was offered to head the scientific leadership of the topic. Research has been conducted for almost five and a half years, from 1932 to 1937 inclusive.

In these large-scale works, the mental suggestion of motor acts, visual images and

sensations, sleep and awakening was investigated. To study the physical nature of the carrier, shielding (with metal) of a mentally inspiring inductor or a percipient perceiving mental suggestion, as well as increasing the distance between the inductor and the percipient (from 25 meters to 1700 kilometers) was used (by metal). The result, Vasiliev writes, was unexpected even for the performers: neither the screening nor the distance worsened the telepathic transmission in all those cases when it was clearly manifested without screening or at a short distance.
(Kazhinsky 1963)

The main issue in this discussion is that of whether influencing was due to Electro-Magnetic waves, which at the time seemed true since shielding blocked the influence attempts, this issue will come up later in relation to gravity and EM in remote influencing.

As previously mentioned Kazhinsky's work was not classified he did not work directly for the Soviet security state, however, others did. Such as Bekhterev who was supervised by Bokia, Bokia later being executed during the Stalinist purges. Kernbach, as previously noted, talks about how research in this area in Russia is still classified some 100 years later. In 1934, the Soviet security state OGPU-NKVD, set up secret labs 'neuro-energetic' laboratory initially with the Moscow Power Engineering Institute, after 1935 in a building of the Institute of Experimental Medicine. Barchenko was involved in study of 'Introduction to the methodology of experimental influence of volumetric energy field', Barchenko docs are still classified, some funding coming from Dzherzhinsky, head of the Secret Police of the Soviet Union.

Meanwhile the Soviet military set up it's labs as well, From 1932-37 USSR's Commissar of Defense studies transfer of information in biological way. In Leningrad at the Bekhterev's Brain Institute, led by Prof. L.L. Vasilyev; in Moscow Laboratory of Biophysics, Academy of Science, led by P.P. Lazarev and S.Y. Turlygin. As Kernbach notes:

It can be assumed that a, more or less, coordinated Soviet program began in 1924, when the Commissar (Minister) of Education A.V. Lunacharskiy (А.В. Луначарский) formed the Russian Committee for Psychical Research at the International Committee of the Psychical Research. Many authors point to a program of the USSR's Commissar of Defense in 1932-1937, related to transfer of information in a biological way. These works were conducted in two places: in Leningrad at the Bekhterev's Brain Institute, led by Prof. L.L. Vasilyev (Л.Л. Васильев) and in Moscow at the laboratory of biophysics, Academy of Science, led by Prof. P.P. Lazarev (Director of Laboratory) and Prof. S.Y. Turlygin (П.П. Лазарев, С.Я. Турлыгин). The Biophysics laboratory was asked to investigate the physical nature of telepathy. For instance, in Moscow's laboratory the first results of biological emission from humans were obtained. In Leningrad, the Brain Institute was requested to perform more psychologically oriented works, such as transferring visual images and remotely influencing the percipient. Both research organizations did not know about the works of each other.
(Kernbach, 2013, 4)

One should note that many scientists concerned in this edge of scientific research eventually found their way on the receiving end of the Stalinist purges, with the execution of Bokia and the

imprisonment of other researchers in the Siberian gulags, effectively taking them out of the research area, although a scientist like Kozyrev was able to continue his theoretical work in Cosmology while in the Gulag. The Stalinist purges beginning in 1937 effectively eliminated research in this area, at least as far as is publicly known. Soviet research did not begin again until after Stalin died and in an attempt to catch up to the Americans and British which were the beneficiaries of receiving German scientists as spoils of war, ostensibly. Project Paperclip brought many German researchers to the United States, however the Soviets captured many leading researchers in this area and took them as prisoners to the Soviet Union.

It is also worthwhile to keep in mind the Weimar German Military (Reichswehr) during this entire time had a secret agreement on cooperation of military technology since 1922 with the Soviet Union, for instance Pascual Jordan lectured at joint conferences of German and Soviet scientists at conferences in the Soviet Union. And as noted before there was cooperation directly between the two countries in all forms of technology.

Another area that is of interest regarding early Russian research is that in the field of microwaves. According to Kernbach, In the 1930s B.G. Michaylovskiy studied the microwave radiation effects on higher nervous activity, using medium/short EM waves modulated by low-frequency signals on separate areas of the brain, which are responsible for emotional state and functionality of different organs. S. J. Turlygin also did studies in the field of human microwave radiation. (See Kernbach 2013) In the 1960s later experiments going back into research done in the 1920s and 30s. Following the work of Michailovskiy and others, it was found that the EM field, with certain parameters, can cause a variety of bio-physical and mental effects. Kernbach states: "It can be assumed that the psycho-physiological effects of microwave emission were actively investigated during the NS [National Socialist, 'Nazi'] regime in Germany, and after 1945 the technology was adopted by the countries-winners [i.e. USA, UK, France, Soviet Union]." (Kernbach, 2013)

Nazi German Research in Neuroweapons:

One of the main stumbling blocks to researching Nazi involvement in Neuroweapons is that most documentation was wether purposefully destroyed by Nazi scientists, destroyed in bombings or taken by the Soviets or by the secret intelligence in the West, locating primary sources remains a difficult task to document their development. However, we can discern from what is known about Nazi medical experiments and scientific research some of the areas they were involved in whether from the German Navy's secret Pendel Research division, a form of early Remote Viewing, to medical experiments under Verschuier which included the likes of Mengele, there are enough pathways of evidence to investigate what they were researching and for what purposes, although sometimes the purposes themselves may be obfuscated.

Psychology was begun in Germany with the work of Wilhelm Wundt (1832-1920) in the famous Leipzig school of psychology. Wilhelm Maximilian Wundt was a physiologist, philosopher, and professor, known today as one of the founders of modern psychology, specifically experimental psychology based on laboratory experiments. Americans influenced by him were Granville Stanley Hall, James McKeen Cattrell, Charles Hubbard, Walter Dill Scott, Edward Bradford Titchener, Lightner Witmer, Frank Angell, Edward Wheller Scripture, James

Mark Baldwin. He also influenced visiting student V.M. Bekhterev, Franz Boas, Emile Durkheim, Ferdinand Tönnies. In 1879, at the University of Leipzig, Wundt founded the first formal laboratory for psychological research. This marked psychology as an independent field of study. By creating this laboratory he was able to establish psychology as a separate science from other disciplines. He also formed the first academic journal for psychological research, *Philosophische Studien* (from 1881 to 1902).

Some of his ideals regarding psychology are:

1. Process theory: Mental phenomena are changing processes of consciousness.
2. Categories: fundamental categories of psychology are: subject, value assessment, the existence of purpose (teleology), and volitional acts (will).
3. Psychophysical Parallelism: certain mental processes regularly correspond to certain physical processes, figuratively they are 'parallel to one another'
4. Causality: Causal explanations in psychology must be content to seek the effects of the antecedent causes without being able to derive exact predictions. Using the example of volitional acts, Wundt describes possible inversion in considering cause and effect, ends and means, and explains how causal and teleological explanations can complement one another to establish a co-ordinated condition.
5. Apperception: based on Leibniz, the process in which the elementary sensory impressions pass into self-consciousness, whereby individual aspirations (striving, volitional acts) play an essential role. Apperception has a range of theoretical assumptions on the integrative process of consciousness. The selective control of attention is an elementary example of such active cognitive, emotional and motivational integration.

During his Heidelberg years, when he was a neurophysiologist, he developed work in sensory physiology, including spatial perception, visual perception and optical illusions, similar in outlook to Gestalt, see below. An optical illusion described by him is called the Wundt illusion, a variant of the Hering illusion. It shows how straight lines appear curved when seen against a set of radiating lines.

Wundt influenced many psychologists of the Nazi era, although Wundt himself, was a liberal democrat during his life, although many conspiracy theories paint him as an evil Illuminati, there is no evidence for such conclusions. Many of his students being immersed in the socio-political world of their times were far-right nationalists as many Germans were at that time in Germany after WWI, feeling persecuted and betrayed by the political order of the times. After Wundt's death the Institute for Experimental Psychology at Leipzig University was headed up by a Nazi named Felix Krueger, see below for more.

German psychology was also where Gestalt Psychology (German: Gestalt "shape, form") was founded and later found a synthesis with Wundt's experimental psychology and Gestalt in the likes of Krueger, Sander and others. In 1890 - The concept of gestalt was first introduced in philosophy and psychology by Christian von Ehrenfels (a member of the School of Brentano). The idea of gestalt has its roots in theories by David Hume, Johann Wolfgang von Goethe, Immanuel Kant, David Hartley, and Ernst Mach. Max Wertheimer's unique contribution was to

insist that the "gestalt" is perceptually primary, defining the parts it was composed from, rather than being a secondary quality that emerges from those parts, as von Ehrenfels's earlier Gestalt-Qualität had been.

Gestalt psychology or gestaltism is a philosophy of mind of the Berlin School of experimental psychology. Gestalt psychology is an attempt to understand the laws behind the ability to acquire and maintain meaningful perceptions in an apparently chaotic world. The central principle of gestalt psychology is that the mind forms a global whole with self-organizing tendencies. Kurt Koffka, "The whole is other than the sum of the parts" is often incorrectly translated as "The whole is greater than the sum of its parts", and thus used when explaining gestalt theory, and further incorrectly applied to systems theory.

The fundamental principle of gestalt perception is the law of prägnanz[de] (in the German language, pithiness), which says that we tend to order our experience in a manner that is regular, orderly, symmetrical, and simple. Gestalt psychologists attempt to discover refinements of the law of prägnanz, and this involves writing down laws that, hypothetically, allow us to predict the interpretation of sensation, what are often called "gestalt laws". As Neuroweapons is an interference in gestalt, research in this area is directly related whether by intention or dual purpose with development of Neuroweapons. Later researchers in Neuroweapons, such as John Norseen, worked with ideals of Quantum Consciousness. Similarities between Gestalt phenomena and quantum mechanics have been pointed out by, among others, chemist Anton Amann, who commented that "similarities between Gestalt perception and quantum mechanics are on a level of a parable" yet may give useful insight nonetheless. Physicist Elio Conte and co-workers have proposed abstract, mathematical models to describe the time dynamics of cognitive associations with mathematical tools borrowed from quantum mechanics and has discussed psychology experiments in this context, which is similar to Norseen's Krylov subspace of the mind. A similar approach has been suggested by physicists David Bohm, Basil Hiley and philosopher Paavo Pykkänen with the notion that mind and matter both emerge from an "implicate order". The models involve non-commutative mathematics; such models account for situations in which the outcome of two measurements performed one after the other can depend on the order in which they are performed—a pertinent feature for psychological processes, as it is obvious that an experiment performed on a conscious person may influence the outcome of a subsequent experiment by changing the state of mind of that person.

Nazis and Psychology

We begin our survey of Nazi psychologists with the eventual head of the Leipzig school, Felix Krueger, after completing his education under Wundt, Krueger eventually relocated to Buenos Aires, Argentina in 1906 at the Instituto Nacional de Profesorado Secundario (National Institute of Secondary Teaching) (Brussino, 2010). He stayed in Argentina until 1908. In 1917, with Wundt's retirement he became the successor to Wundt's Institute for Experimental Psychology. From this point on the Institute became identified with far-right nationalist sentiment. Under Krueger:

In the 1920s, the institute occupied 34 rooms in the university's main building as well as a smaller office in the city, huge for the time. Krueger had four regular assistants, each of whom was responsible for his own department: Professor Otto Klemm was responsible for applied psychology and experimental pedagogics; Professor August Kirschmann for measurement methods and psychology of perception; Professor Friedrich Sander for psychology of the higher functions; and Privatdozent Hans Volkelt for developmental psychology, including child psychology (Marx, 2013)

Krueger responded to gestalt theory of the Berlin type with his own brand of "holistic psychology" (Ganzheitspsychologie). Instead of patterns (gestalten), he named "complex qualities" (Komplexqualitäten) as the primary perceptual phenomena. These diffuse, quasi-multidimensional perceptions comprised thought processes as well as emotions. However, children were unable to differentiate these complex qualities. Human maturation manifested itself as complex qualities became more structured through experience and reason. This meant that holistic psychology was oriented more towards development and evolution than gestalt psychology. Although Krueger vied with the gestalt psychologists to prove that his own version was the original approach, he was heavily influenced by gestalt theory. Thus his holistic approach can at least partly be explained by his efforts to outdo his rivals in the new discipline. He conceded that gestalt psychology was a step in the right direction but maintained that a conclusive psychological and philosophical explanation of the psyche could only be provided by the Leipzig school.

The focus on the emotions was crucial to the profile of the Leipzig school and was the most important task of psychology from Krueger's perspective. Although his student Verwoerd (see below), however, took a completely different view in his doctoral thesis. Verwoerd treated the emotions as phenomena which could be isolated and evoked, rendering them measurable and open to manipulation. This is very far from Krueger's concept of the complex quality and the "holistic experience", which emphasised the diffuse and unfathomable nature of emotions.

From Krueger's perspective the emotions formed a tight cluster of complex qualities in which rational thoughts manifest themselves, but these were so dependent on their emotional environment that it was almost impossible to investigate the complex empirically. Albert Wellek, a student of Krueger's in the 1930s, explained that feelings lost their intensity when under observation, making it impossible to analyse them. Verwoerd's own position was rather different, because he states in his thesis that the declining intensity of emotions is measurable and that emotions are open to analysis. He probably didn't know about Krueger's approach before he came to Leipzig since he did not quote any of Krueger's publications in his doctoral thesis. (Marx 2013)

Krueger's theoretical conceptualisation of holistic psychology encouraged the absorption of both volkish ideologies and nationalist ones. Holistic psychology was closely interwoven with an ideological and political undercurrent that operated in the context of wholes and transcended the psychology of the individual through the community perceived as a volk:

"Although working in different fields, our efforts aimed at an understanding of community life, especially that of the volk." It comes as no surprise therefore, that both Krueger himself and some of his assistants, such as Volkelt and Dürckheim, were involved in right wing politics as early as the 1920s: "The Psychological Institute was regarded as a 'völkische Zelle' (volkish cell)."

It was the logic of holistic psychology's internal dynamics that led Krueger to wave goodbye to empirical research after 1917. Henceforth he devoted his energies to presenting his ideas in a very general philosophical framework that had less and less to do with practical psychological research. In keeping with this view, Krueger dropped the word "experimental" from the name of Wundt's institute, renaming it the Psychological Institute in 1925.

Attached to the Institute where those influenced by Krueger as well as generating their own research and ideals on psychology.

In 1925 Erich Wohlfart worked on Aktualgenese which he first articulated in his Ph.d. Dissertation at Leipzig (Abbey & Diriwachter, 2008). Later, during the 3rd Reich he was a Wehrmacht psychologist from 1933-35. (Geuter, 2008)

Aktualgenese

Actualism is a term derived from gestalt psychology. This refers to the emergence of a perception from more complex, holistic pre-forms, or the process of the differentiation of perceptual contents. If the term is limited to human perception, the actual fact that a complex object is not immediately captured completely, but is recorded in a single step in a process. These steps do not occur deliberately. In a wider sense, one can also describe other psychological processes in this way. For example, the emergence of emotional excitements: from the first impression of a situation, several steps are passed through until one realizes the full experience. The emergence of emotions can take place differently depending on the triggering event and person. The development of a possible envy or jealousy feeling of a little boy on the newborn brother runs differently than the frightening reaction when driving, when an obstacle appears directly in front of the car.

This research would later contribute to the understanding of how to manipulate these processes.

At the same time I.G. Farben was creating in 1925, methamphetamines, heroin, and morphine. Under the work of Otto Freidrich Ranke he introduced methamphetamines into the Wehrmacht, receiving funding from the Rockefeller Foundation, his Ph.D. Dissertation: "The

Rectifier Resonance Theory: An extension of the Helmholtz resonance theory of hearing by physical examination of the cochlear fluid oscillations, similar to Kazhinsky, in 1931. He was a member of the SA (Sturmabteilung), Storm Troopers. Eventually, in 1939, the widespread use of these drugs would lead the Minister of Health, Leo Conti to declare that the entire German nation seemed addicted. This would be considered to be nootropics by today's neurowarfare terminology. The goal of this of course was to create a drug induced super soldier of the Blitzkrieg (speed war). Even today, low doses of meth are given to US troops in combat to fight fatigue.

In 1926 an interesting student of Krueger's was Hendrik Verwoerd. After his studies at Leipzig he returned to his native South Africa and became a member of the Fascist, National Party. He was known as the architect of Apartheid. He wrote in 1926 "A method for the experimental production of emotions". He was later chair of the Applied Psychology and Psycho Technique at the University of Stellenbosch.

Hendrik Verwoerd and the Leipzig School of Psychology In investigating Moodie's allegations regarding the formative influence of German intellectuals on Afrikaner nationalism, it makes sense to concentrate on Verwoerd's time in Leipzig because the Psychological Institute there is the most likely site of the alleged political influence from German scholars. It was the Leipzig psychologists who exhibited rightist political leanings, unlike their colleagues in Berlin and Hamburg, none of whom were drawn by radical nationalism. (Marx, 2013, 92)

Chris Marx gives the following biographical information regarding Verwoerd's education:

Verwoerd studied psychology and philosophy at Stellenbosch and wrote a Master's thesis in each of these subjects in 1922. From 1923 he was a lecturer in psychology at Stellenbosch. He wrote his PhD thesis, entitled "Die Afstomping van Gemoedsaandoeninge" (The Blunting of the Emotions) based on laboratory experiments. He received his doctorate cum laude from Stellenbosch University in 1924 and was awarded a £150 Croll & Gray scholarship to study abroad. He spent three semesters in Germany (1926-27) and three months in the USA. (Marx, 2013)

While at Leipzig he also studied under Richard Pfeifer (1877-1957) on the "Psycho Pathology of Children and Youth" as well as a course on "Psychological Therapy and Hypnosis", as well as under Franz Exner (1881-1947) the "Fundamentals of Criminal Psychology, as well as with August Dollken, professor of medicine on the same topic. (Marx, 2013, 105)

Verwoerd being the one time Prime Minister of apartheid South Africa does raise the possibility that his research became state funded and underwritten.

In 1926 Hans Volkelt became assistant professor at Leipzig. He took Krueger's holistic psychology and made it applicable for empirical research. He specialized in child and developmental psychology (Marx, 2013, 100). Marx relates on Volkelt's relationship to the Nazi party and the Institute:

In 1926 Volkelt became assistant professor. He and Graf Dürckheim-

Montmartin were the earliest and most outspoken adherents of National Socialism at the Leipzig School. Volkelt became a member of the Nationalsozialistische Deutsche Arbeiterpartei (NSDAP), the National Socialist German Workers' Party, as early as 1932, one year before Hitler came to power, clear evidence that he joined the party out of conviction rather than opportunism. Under Krueger, the Leipzig Institute adapted very quickly to the new regime and some of its members publicly acclaimed the National Socialist assumption of power. Krueger himself had been an exponent of the radically nationalist and volk-orientated rightwing for many years already. In 1935 he became rector of the university, but was forced to resign by the Nazis after referring in a public speech to Heinrich Hertz as a "noble Jew". (Marx, 2013, 103)

Other notable Leipzig connected researchers included

Freidrich Sander, 1942 - assistant to Wundt he was a member the Nazi Party. Taught after WWII in German Universities. Published with Kruger "Gestalt und Sinn". Published "Functional structure, power of Experience and Form" (1942). Worked with Wohlfart on Aktualgenese: the emergence of a perception from more complex holistic pre-form on the process of differentiation of perceptual contents", the link to neuroweapons is obvious.

Sander founded the school of genetic holistic psychology with F. Krueger. Based on experimental perceptual investigations, he developed the concept of actual genesis (emotion), which describes the process of creating a creative experience, and claimed that the Gestalt qualities are preceded by so-called full qualities. Also known was the "Sandersche figure", an optical illusion (Sander's illusion). In the period of Nazi rule, Sander saw in holistic psychology a contribution to the so-called reorganization of national life. In 1962 he presented a collection of the works on holistic psychology (holistic psychology, fundamentals, results, applications, edited by H. Volkelt). Later, he was found to have committed fraud in his research and undermined Wohlfart. (Abbey 2008, 40)

Otto Klem, whose department focused primarily on the psychology of physical activity. "There are studies of working procedures, fatigue, aptitude tests and related psycho-technical testing. The methods are tested and applied to carefully chosen cases." Klemm's department collaborated with industry as well as employment centres in testing applicants for specific jobs so that his research contributed to optimising workplace conditions. Peter Behrens identifies four main areas of Klemm's research, namely: "human work, equipment, and control design; human performance and mental functioning; forensic psychology; and mental ability testing and vocational guidance." (Marx, 2013) In other words, charecterology, which is used in profiling targets of neuroweapons.

Karlfried Graf Dürckheim-Montmartin, the son of an impoverished aristocratic family, who had taken part in the violent suppression [freikorps] of the short-lived Munich Soviet Republic in 1919. Dürckheim-Montmartin studied psychology and moved to Leipzig after completing his doctorate in Kiel. He worked as a voluntary assistant at the university from 1925 and was given

a regular contract at Krueger's institute two years later. Although Verwoerd did not attend any of the count's courses, they obviously knew each other. A few years later both of them participated in the 1934 congress of the New Education Fellowship in South Africa, organised by Ernest Malherbe. (Marx, 2013, 102)

Wilhelm Wirth - Leipzig, psychophysics (nueroweapons relevant), Nazi party member. In 1897 he received his doctorate. After studying in Leipzig, Wilhelm Wundt offered him an assistant position. Wirth habilitated in 1900 with the work *The Fechner-Helmholtz's Theorem on Negative Afterimages and Its Analogies*. He founded in 1902 the Society for Experimental Psychology. In 1940 he became a member of the NSDAP.

In 1908 Wirth was appointed professor. During this time his main works, the consciousness phenomena and the methods of experimental psychology emerged. His research goal was to gain precisely measurable stimuli and clearly agreed arbitrary behaviors between the experimenter and the subject as the basis of a generally comparative situation of consciousness. In 1938, he defined: "The entire knowledge of quantitatively comprehensible laws of mental performance vis-à-vis the outside world can be described as psychophysics in the narrower sense." Starting in 1926, the precision of the coordination between optical perception and subjective movement emerged for Wirth.

In 1933 he signed the professors' confession at the German universities and colleges to Adolf Hitler.

Albert Wellek, who was at the institute from the late 1920s onwards and created a legend after the war about the institute's distance from the National Socialist regime. In his autobiography he took great pains to circumvent his own sympathies with right wing positions. Wellek was the most prominent psychologist to fight for a continuation of the Leipzig approach of holistic psychology after the Second World War when he became a professor in Mainz and a highly influential figure in psychological organisations. (Marx, 2013, 103)

Johannes Rudert (1894-1980) at Hiedelberg, army psychologist. Injured in World War I losing function of his right arm, of which he turns into a dissertation with injury-related left-handedness in his 1925 thesis "Casuistic contribution to the theory of functional asymmetry Cerebral hemisphere". After the graduation he works in the army psychology of Reichswehr and participates in the development of diagnostic methods for Officer selection. 1929 assistant to Felix Krueger at the Psychological Institute in Leipzig begin his characterological and expressive psychological studies. In 1935 he applies for habilitation at the Faculty of Philosophy in Leipzig with the thesis "Typology and Characterology - To the problem of characterological classification". From 1936-1941 he was active as Senior Army Psychologist at the Psychological Testing Offices of the Reichswehr in Brunswick and Wiesbaden. In 1941 he is sent to the University of Leipzig appointed associate professor of psychology and succeeds Philipp Lersch the Deputy Head of the Psychological Institute.

One area of research that is worthy of note of Rudert was his development in the characterological field. Recruiting young talent for technical special services. He developed what became known as the 'film method', originally created by Philipp Lersch, in which a subject was sent to a filming studio to be examined by a team of doctors from behind mirrors, while being surreptitiously filmed. The examinee would be asked for his name, then he was told to go to be photographed, and he could get ready in front of a mirror. Through which the filming occurred. The tests took three days each of the subjects having 2 psychologists examine them, they pried for different emotional states in front of the mirror while being filmed. (Geuter 1982)

Nazi Researchers Other Than the Leipzig School:

Leipzig was not the only center of psychological research in Nazi Germany. Others engaged in studies related to the mind and its inner workings. Such as Matthias Heinrich Goring, the cousin of Herman Goering, who founded the German Institute for Psychological Research and Psychotherapy in 1933. The fact that Psychological research was considered a national interest and even secret is witnessed in the redacted notes of some Psychological conferences in Germany:

Hartnacke classifies that in science "The highest standing, which is related to securing the existence and raising of the people, whose Daseinssicherung and Erbgutpflege "(S.4) ... Psychology should be a servant and Be a leader and show educational boundaries ... Ergege for genetic engineering and psychological knowledge to found and strengthen the educational work ". (S.5) There was a concerted effort by someone or org to obfuscate the proceedings of the 1933 Psychology conference, with lines blackened out and entire speeches deleted from the record of the meetings:

Completely missing the total lectures "of German kind, LF Clauss" , "the counter type of the German-volkischen movement, ER Jaensch" , "The Erbbiologische and genealogische Contribution to the psychology of racial purity, Prince Von Isenburg" and "The problems of Political Psychology, Poppelreuter " . (Hachmann-Gleixner, 2019 pg. 49-50)

The work of George Muller is of interest, as his findings later went into developing psychological profiles of people based on color (farbe) theory, which Capt. Roder of who shall read about later studied in the 1950s in correspondence with Hans Bender. In 1930, George Elias Muller, a founder of psychophysics, Color phenomena (see Verschuer below for continuation of research) Müller retired in 1922, afterwards he began studying color phenomena, during his study of color phenomena he advanced Ewald Hering's theory of color and elaborated on the two stage theory. The first stage involved the retinal receptors and then the signals were transformed into the four opponent primary colors; in 1930 he wrote two summary books that helped define color theory. His student Erich Jaensch further elaborated on this topic. Jaensch, here he put forward further considerations Aubert-Förstersches

phenomenon that the perceived size of an object does not coincide with its size of the image on the retina . Especially the lateral seeing found his attention here. He was at the University of Strasbourg in writing 'about the perception of space' receiving a habilitation. His duplicity theory begins here. Jaensch assumed that periodic vibrations were absorbed by the cochlea , while aperiodic vibrations were absorbed by other parts of the ear. Vibrations exhibiting both periodic and aperiodic character, on the other hand, would be perceived by both the cochlea and other organs.

Also, related to the study of vision is that of Wolfgang Metzger who in the 1930s established that when subjects gazed into a featureless field of vision they consistently hallucinated and their electroencephalograms changed. Ganzfeld was later revisited by Hans Bender, see below.

Finally, we have the work in parapsychology, which would become integral to neuroweapons development. Perhaps, the most famous parapsychological researcher that was also a Nazi was that of Hans Bender, who was also a member of the SS Ahnenerbe, the scientific arm of the Nazi SS. After graduation in 1925, he first studied law in Lausanne and Paris. In 1927 he transferred to the study of psychology, philosophy and Romance languages in Freiburg, Heidelberg and Berlin. From 1929 he studied in Bonn with Erich Rothacker (psychology) and Ernst Robert Curtius (Romance Studies). After the " seizure of power " of the National Socialists , he was in 1933 short-term member of the SA. Parallel to his position as Assistant Professor at the Psychological Institute of the University of Bonn. Bender was disabled and not able to serve in the military. Thus, he became a professor at the University of Bonn.

In 1932, Hans Bender's experiments dealing with "automatic spelling" ("glass tilting") were performed between 1932 and 1933 at the Psychological Institute of Bonn University under the auspices of Erich Rothacker and were published in 1936 as a Ph. D. dissertation under the title *Psychische Automatismen* (Psychic Automatisms). In an interesting development as a student under Kurt Beringer at Bonn University he participated in studies on mescaline, which were a focal point of later pharmacological searches for a 'truth serum' in interrogations notably with the German-CIA program Project Artichoke. Bender and Jaensch intersect as Jaensch wrote the preface to a work of Benders on parapsychology in 1936. In 1939 Bender completed a medical degree, which should give him a greater reputation in view of his controversial research interest. For his assertion that after his medical state examination and his license in Freiburg in 1939 with a thesis "The working curve under pervitin [pervitin=amphetamines]" in medicine with Kurt Beringer receiving a doctorate. He also writes of starting a Parapsychological Institute, inviting psychics to participate in 1939.

After the war Hans Bender was detained but subsequently released. In 1950 he established The Institute for Fringe Areas of Psychology and Mental Health at the University of Freiburg in 1950. From 1942 to 1944, he taught at the Paracelsus Institute studying ESP.

Interestingly, after the war he maintained a correspondence with Capt. Hans Roeder who headed up the secret early remote viewing program of the German Navy in Berlin. We shall examine their correspondence shortly.

Another development of interest is his work in 1966 with physicist Burkhard Heim, who he hoped to engage in a physical explanation for certain psychic phenomenon, most notably transcommunication. Bender engaged several physicists in pursuit of a physical explanation, such as Rolle. Interestingly in the development of the Ganzfeld, he conducted a national

experiment on television to measure people's psychic abilities through the medium of the television, television telepathy in 1968. Which was based on research conducted in the 1930s. It should be noted that in 1967 he was contracted by the US National Security Agency to conduct experiments regarding psychic phenomenon.

A CLASSIC CASE

I. An Illustration

**Rosenheim Germany 1967, Evidence: Videotape and Electronic Recording
Instruments - Scientists: Physicists/Parapsychologist**

Phenomenon: Neon lights blackout

- Automatic Fuzes Blown
- Movement 400 lb. Storage Cabinet
- Pictures Swing Around
- Frequent Electronic Dealing of Number 0119

Scientists

**Physicists: Dr. F. Karger
G. Zuha**

Parapsychologist/Psychiatrist - Dr. Hans Bender

**Institution Involved: Institute for Border Areas of Psychology and Mental
Health - Freiburg University**

II. Pertinent Scientific Perspectives/Models

A. Quantum and Relativity Physics:

1. "S" Matrix Theory (including hadron models)
2. Bell Inequality/EPR Paradox (7 Experiments)
3. The Action of Consciousness on Matter: A Quantum
Mechanical Theory of Telekinesis by Rich Mattuck, Evan Harris,
Walker
4. Elizabeth Rauscher's "Higher Dimensional Geometrical Models"

B. Parallel and Identical Experiences of Identical Twins

C. Evolutionary Model of Pierre de Chardin (Noogenesis)

Declassified in Part - Sanitized Copy Approved for Release 2011/12/01 : NSA-RDP96X00790R000100030045-6

<https://www.cia.gov/library/readingroom/docs/NSA-RDP96X00790R000100030045-6.pdf>

Nazi Remote Viewing

As mentioned earlier the German Navy had a prototypical Remote Viewing program under the leadership of Capt. Hans Roeder, who previously had served on submarines.

To take a step back it is important to look at the historical development and attitudes toward parapsychological research in Germany. One of the first Germans to study psychic affairs was Rudolf Tischner (1879-1961), he was originally an ophthalmologist, revisiting the eyes to psychic research, He practiced in Munich he published on telepathy and other psi effects in 1921 in a monograph 'Telepathie und Hellsehen'. Tischner called telepathy and clairvoyance

Außersinnlicher Wahrnehmung, extrasensory perception.

A description of his of one experiment serves as a strong parallel and even perhaps the prototype for the format of a US Military trained Remote Viewer, where white envelopes with unseen gps coordinates are written inside the opaque envelope unknown to any that could transmit the information to the viewers, Tischner's experimental description:

These experiments involved selected participants in identifying the targets – typically, text or drawings – concealed in opaque envelopes, while (unlike a telepathy experiment) no persons were aware of the contents of the envelope.

Telepathy was used early in the German Police investigations according to Wernet 2013. Its interest to official government offices was not limited to police investigations. During the war a special department developed in German Naval Intelligence to investigate translocation of enemy ships. The staff of this department developed out of earlier 'Occult' scientists. This organization was founded in 1919 as the German Okkultistische Society' (D.O.G.) under the chairmanship of physicist and mason Dr. Werner Haken, who led until 1923 when it was renamed 'German Society for Scientific Occultism' (D.G.W.O.). Its vice president was a scientist of interest and a member of the special Navy department, later known as the 'SP Department' (sidereal pendel), Lt. Col. A.D. Konrad Schuppe, who was the recruiter for staff for the department (Walther, 1949), understandably the department was recruited from membership of the Deutsche Gesellschaft für wissenschaftlichen Okkultismus (D.G.W.O.). The military interest in occult studies is also attested to in that Schuppe also briefed the III Army Corps General Command on Occult sciences. In 1939 the society changed to the 'German Metaphysical Society'. At this time Schuppe was interested in ganzfeld or earth's radiation, electromagnetism and dowsing (remote location of water), theoretically feeling the weak electromagnetic fields of water in comparison to solid earth. Another member of the SP Department was the chemist Dr. Fritz Quade.

It is important to put developments in parapsychology (okkultisme) in a historical context at this time. Shortly before the founding of the SP department in 1942 it was banned in the Reich to practice in any way Okkultisme things. This developed out of a suspicion that occult practitioners had steered Hess to go to Great Britain in an effort at forming a German-British fascist alliance, or "peace", allegedly with Lord Hamilton, a British occultist and Nazi sympathizer. In response to the development of Hess being captured the Gestapo banned all occultish practices. At this time Schuppe and Quade were arrested for several months. However, the military became interested in this research, as well as Heinrich Himmler. Another member of the SP Department was Dr. Hans-Hermann Kritzinger who was an astronomer, he founded the German Association for Solar Observations, previously employed by the Air Force and Army Weapons Office for Ballistics studies. In 1940 he was working for the Propaganda Ministry after Goebbels became interested in the prophecies of Nostradamus about the downfall of England in the end times and wanted to use it as propaganda. Kritzinger had written about this prophecies so was a person of interest to Goebbels. As one who claimed to specialize in dowsing he became of interest to the military work with the SP Department.

One of the most renowned persons researching dowsing and pendel was that of Ludwig Straniak (1879-1951). Who in 1936 started the Society for Scientific Pendulum Research

(Gesellschaft für Wissenschaftliche Pendelforschung) which was dedicated to the National Socialist cause. He believed in 8 great forces (Große Kraft) in the universe. He wrote a book on Pendel techniques, 'Das siderische Pendel als Indikator der achten Naturkraft' (Straniak, 1937). In one chapter of this book, written by Arnold Mannlicher, 'Biologische Strahlenforschung und Elektrotechnik', The belief in polar coordinates system is presented, it was also claimed to be able to use the pendel for diagnosis in the human body, he wrote:

Zum verstandnis der Angelegenheit muß ich einiges über die normalen Polaritätsverhältnisse des menschlichen Körpers vorausschicken. Es verhält sich dieser nämlich vergleichbar einem richtig aufgeladenen elektrischen Akkumulator, nur handelt es sich im Gegensatz zu letzterem, der nur zwei Pole besitzt, beim menschlichen Körper um deren sechs. Da der Organismus des Menschen in jeder der drei Axen eines räumlichen Koordinatensystems (Nord-Süd, West-Ost, Tief-Hoch) in positivem oder negativem Sinne durchstrahlbar und polarisiert ist, ergeben sich (bei der Orientierung mit dem Rücken nach Norden und dem Gesicht nach Süden und bei "Stromabnahme" über der Wirbelsäule zwischen den beiden Schulterblättern) acht verschiedene "Achsengruppen", und zwar: Nord-West-Tief, Nord-West-Hoch, Nord-Ost-Hoch, Nord-Ost-Tief, Süd-Ost-Hoch, Süd-West-Hoch.

To understand the matter, I must first state something about the normal polarity relations of the human body. It behaves like a properly charged electrical accumulator, only in contrast to the latter, which has only two poles, the human body has six. Since the organism of the human being can be irradiated and polarized in each of the three axes of a spatial coordinate system (north-south, west-east, low-high) in a positive or natural sense, there are (by the orientation with the back to the north and the face to the south and with "current collection" above the spine between the two shoulder blades) eight different "axis groups", namely: north-west low, north-west high, north-east high, north-east low, south- East High, South West High. (Straniak 1937)

I would prepare a few years to the understanding of the matter for the normal polarities of the human body. It is unable to behave a properly charged electric battery, but it is only contrary to the latter that has only two poles, at the human body of their six. Since the organism of man in each of the three axes of a spacious coordinate system (north-south, west-east, deep-high) is unbalanced and polarized in positive or negative sense... ..eight different "axes groups", namely: North-West-deep, North-West-High, North-East-high, north-east-deep, Süd-East-high, Süd-West-High. (Straniak, 1937)

The observation of the bodies polarities is an essential aspect of the Nazi Remote Viewing program, this is also observed by physical experiments where an east-west axis is observed as we shall read in a later chapter in the work of Persinger. In the pendel research it was observed those that were more successful had a reverse polarity in their fingers from those that were not, it was observed that this was a biological difference where the successful viewers had an polarization abnormality.

Also published in Straniak's work is that of Mannlicher who was a Swiss physician that believed that the earth 'radiated' as related to radionics, and that this earth radiation interfered with human health. This would later be related to the natural earth electromagnetic field and gravity, as gravity is different in different areas of the earth. Indeed, Hitler himself believed in these theories as related by Kurlander: 'Hitler himself employed diviners to check the Reich Chancellery for cancer-causing 'death rays'. " (Kurlander, 504)

In another chapter Straniak himself describes in detail how to work the Pendel in the coordinates system. (Straniak 1937, 17-18)

So with this understanding we can better put the work of the SP Department into a historical and scientific background and understand where these beliefs originated from.

The SP Department operated under a 'top secret' rubric. Another member of the team, who later quit, was Gerda Walther. She notes in her letter regarding 'ESP in the German Navy' that she was not allowed to refer to the head of the department, Capt. Hans Roeder as "Captain", just Mr. Roeder. (Walther 1949). Another member the Astrologer Wolff claims that the activities there had been 'strictly confidential' and that the staff members had been under the impression of being constantly supervised [under watch]." (Black et al, 164). The career of Capt. Hans A. Roeder began in WWI as a Uboat commander, he became an engineer after the war, publishing 'The Technical Computing' in 1933. In 1939 he returned to active duty as a Navy Captain assigned as a general consultant for the Inventions und Patentwesen Office of the Navy Main Weapons Office. Interestingly, he was a self-ascribed channeler or what was termed 'commuter' [channeler, clairvoyant]. Initially calling this research

"...the Navy Intelligence Service supported research on 'Optical Location'; an 'invisible, active locational method' was supposed to be developed. See Bundesarchiv-Militärarchiv Freiburg i. Br." (Anton, 2015, Note 37)

Later, it was named the Sidereal Pendel Program. He reported to an Admiral Raeder who was Chief of Naval Operations. Others with knowledge of the program were former Freikorps Marinegroup Eberhardt member Adm. Otto Schneiwind and a Rear Admiral Gerhard Wagner (1898-1987), from 1941 to 1944 Chief of the Operations Department in the Naval High Command, who reminisces about the work of Capt. Roeder:

"R [oeder], the commuter, was known to all of us. His work was from that point of view not so unusual. After all, one constantly thought about new techniques, and when now someone came who declared that he could achieve something by a certain method, then Of course it was natural that they gave him the opportunity (Anton, 2015)".

The structure of the German Naval research of the time is interesting as related by Anton et al, 2015:

About the exact date of construction of this special group in the Kriegsmarine, the corresponding establishment decisions and their justification as well as the organizational Framework conditions are still little known. So far, no relevant documents and sources on these issues. That's how we stay in some places, of necessity, rely on assumptions. Most of the following Detailed information comes from retrospective eyewitness accounts and are accordingly to judge critically If we follow the remarks of Gerda Walther and Wilhelm Th. H. Wulff, existed the "SP Division" in the spring of 1942, when both first heard about her, already. The other available reports also suggest an emergence at the beginning of the year 1942. Who gave the order to set up the experimental group, who was informed and who was the driving force behind the experiments within the naval line However, this must remain unclear in the current source situation. Wulff mentions that at least the fleet chief Admiral Otto Schniewind [freikorp member of Marinegroup Eberhardt] was informed about the experiments. On the other hand, it can be proven that the coordination of the pendulum locomotion tests in naval intelligence (MND) lay in the naval warfare. In cooperation with the MND, the Naval Weapons Main Office and there the General Office worked "Invention and patenting" at the trials. The naval intelligence service had since 1942 several "working groups" on the topic "vibration research for the submarine war ", in which also the patent department of the navy was also involved in the special border-scientific research in the context of one of these "working groups" of the MND, but there are no clear evidence. About the work of the General Department "Inventions and Patents" in the Naval Weapons Main Office There is almost no information left. With effect from 1 September In 1942, this department became Division IV in the new office group "Research - Inventions - Patent Administration (FEP) ". The new FEP, headed by Rear Admiral Wilhelm Rhein, now comprised four departments: FEP I: General Research Control, FEP II: Research Organization and Reporting, FEP III: Research Division, FEP IV: Inventions and patenting. The bureau should answer all questions for the navy research, inventions and the patent system can provide exhaustive information, Maintain contacts with research centers and intensify marine research in general. Their establishment was in response to the increasingly lossy and dogged guided submarine warfare, which the German navy to an extension of the Efforts in research and development. For the year 1943, the Amtsgruppe as an extremely large apparatus with a variety of supervised scientific and technical research projects. Occupied is a huge effort with numerous supervised internal and external projects. In 1943 alone, around 1000 "research tasks" were fulfilled. In 1943, the FEP IV department processed around 13,000 applications for new developments. The work program in the previous year, 1942, can not be translated into writing sources are hardly anything to be said. In the night from the 22nd to the 23rd of November In 1943, the Berlin office building of the FEP was in the Admiral-von-Schröder Straße 31/33, complete with all documents stored there, were destroyed by an air raid. Amtsgruppenchef Rear Admiral Wilhelm Rhein had on 22 December 1943 report: "All the files in the house were destroyed by the fire. "This information is confirmed by a later report of March 27, 1944: "As it is Almost 1 year had just been achieved, with a separate service building for the Amtsgruppe This was due to fire as a result of the bombing of 22.11.1943 completely destroyed." In this war destruction lies

presumably the central one Reason that no written legacies to the border science have been handed down.

(Anton et al, 2015, 297)

With the almost total destruction of Germany during the war and the self-destruction of important research records it is almost untraceable to find documentation on these secret programs. Gerda Walther and Wulff's accounts are the main sources of information on this project. As stated above the project was begun because the German's felt they had fallen behind what they believed to be a British optical location project. Capt. Roeder held this belief, although it would later turn out that the main cause of the uptick in sinking of German naval vessels was Turing's team's work on cracking Enigma with the Bombe computer. Though, it should be noted Roeder may have been aware of the work of Harold Sherman and Sir Roy Wilkins in Great Britain, "Thoughts Through Space" that did Remote Viewing experiments for locating ships. Thus, being a rationale for German investigations.

Another interesting person working on the SP Department project was Dr. Wilhelm Hartmann, who performed characterological or 'aptitude-tests' on staff members to assign them, although a Astronomer and Astrologer, he was a member of the Tattwas Team on the SP Department, studying the aspects of the planets, which seems to be related to Alfvén waves, the magnetic grids in the universe, and of course gravity. Though the early staff was to be comprised of people attached to the scientific study of the occult, Capt. Roeder was specifically looking for a way to train normal Naval personnel to do this 'locational' work. As noted earlier, Walther broke with this work group. The issue was the difference of opinion on what this ability really was. Where Capt. Roeder searched for a cause based in physics, Gerda Walther believed it was 'supernatural'. She recollects:

But being a materialist he always came back to his opinion that it was essentially a problem of physics, not of psychology or parapsychology. (Indeed this stubbornness of his at the end gave me an excuse to decline working there as our views were too much apart.) (Walther 1949).

The cause being purely physical was investigated through other studies of the group that looked at what materials the pendel should be made and what kind of string to hang the pendel from. They performed many experiments to try and bring the study into a science. In the end, the Navy saw no merit in this attempt at location. Although, it is claimed Straniak was able to demonstrate it's use. Ostensibly, it ended with negative results.

Another interesting perspective of Gerda Walther's was that of the lead the Anglo-Saxon powers as she called them had in parapsychological research of the day, she writes:

I said it would now avenge itself psychical research had been neglected to such an extent [all these years compared with the Anglo-saxons countries, it needed years of careful research whether and how ships could be detected and placed by the pendulum and not even the very first preliminaries existed, I doubted whether they did in England or the United States, although they were far ahead of Germany in all these things... (Walther, 1949)

The question of what happened to this research after 1942 is a provocative one. Given the SS involvement and Heinrich Himmler's personal involvement in the Thule Society. Scholars have noted:

"Concerning an 'answer to the problem of the dowsing rod' and the research field of radiesthesia, for example, the Reichssicherheitshauptamt (RSHA) of the SS as well as National Socialist leadership circles made increasing efforts over the course of 1942 to get a better handle on the (technological) foundations and possibilities." (Black et al, 2015, 166)

Previous to this the SS had been involved in cultivating occult science to their mission. In 1937, the following from Kurlander:

On Dr. Kiendl's support for Werner Kittler's "original and useful method, in which he brought together natural scientists and astrologers" in working groups in the Reich Literary Chamber and the Reich Ministry of Propaganda (hereafter RMVP), see BArch, R 58/6206, report from Kiendl to Hörmann, Sept. 2, 1938, 8; BArch, R 9361V/1107, Werner Kittler biography (March 14, 1938), application (June 13, 1938).

It is not without some technical reasons that astrologers were consulted, for instance one of the areas studied by Roeder's Biolocation project was that of *zatwas* or astrological aspects). The issue for the differentiation between charlatanry and real scientific investigations is considered in a correspondence between Himmler and his Intelligence chief before Schellenberg, Heydrich, Kurlander notes:

BArch, R 58/6207, letter from Himmler to Heydrich, Jan. 10, 1939. For more on careful attempts by the SD and the Gestapo to differentiate between "scientific occultism" and occult charlatanry, see BArch, R 58/6206, letters from Haselbacher to the Gestapo (March 29, 1937),

As well as:

"Himmler was deeply invested in occult and border-scientific thinking and saw no incompatibility between actively policing commercial occultism and selectively appropriating 'scientific occultism,' whether for developing military technology, gathering intelligence, or making political prognoses. These differences within the upper echelons of the SS and police administration might explain why Nebe, as head of the Kripo, proposed a middle way that preserved a space for 'scientific occultism' while moving against 'every activity that rests on and exploits superstition'" (Kurlander, 506)

“The new campaign against occultism also failed to dissuade Goebbels’s ‘Expert for Cosmobiology’ in the Reich Literary Chamber, Werner Kittler, from eagerly recruiting dozens of famous astrologers, dossiers, and cosmobiologists to study the potential benefits of various border sciences. Even the SD and the Gestapo commissioned dozens of reports and peer reviews aimed at differentiating between ‘scientific occultism’ and charlatanry. Himmler himself advocated this policy in a January 1939 letter to Heydrich:

‘As you know, I do not consider astrology to be pure humbug, but believe that there’s something behind it... We must do much more to restrict [charlatans] so that we only allow specific communities of research (bestimmte Forschungsgemeinschaften) in this sphere.” (Kurlander, 507)

“Beginning in September 1939, Himmler, Hess and Goebbels recruited dozens of ‘scientific’ occultists to assist with obtaining military intelligence and producing domestic and foreign propaganda” [PSYOPS]. (Kurlander, 511)

“Goebbels and Himmler even employed Kisshauer to review the talents of German astrologers and pendulum dossiers [remote viewing, dowsing], the most ‘scientific’ of whom they hired to assist the SS and the Propaganda Ministry in gathering military intelligence and producing propaganda” (Kurlander, 519)

So obviously the SS was already entangled in this research even before the Wehrmacht showed interest through such groups as Naval Intelligence in edge science or border science.

Indeed, there is evidence that these programs continued as noted in relation to the campaign to free Mussolini in Italy after the fall of the Fascist regime there:

In 1944 the SS employed psychics to locate Mussolini, subsequently with their help he was located. After this secret experiments were conducted with psychics. This was known as ‘Operation Mars’, source of information on this was Walter Schellenberg, Himmler’s assistant.
(Black et al, 2015, 168)

The operation to locate Mussolini was conducted in what today would be defined as military remote viewing. It is disputed whether real human intelligence led to his release by German special forces led by Skorzeny or whether it was intelligence from remote viewing. Skorzeny remarked regarding the use of this NEURINT that:

“It was Himmler who was said to believe in these always somewhat disputed sciences. I was never told about any positive result of these ‘investigations.’” (Black et al, 170)

After the war’s end, there is evidence that structured or organized Nazi research in edge science continued. This now brings us to another Pendel researcher during the war, that of

Hans Bender. Indeed, after the war in 1952 there is evidence of Capt. Roeder continuing research in parapsychological areas. He and Bender exchanged letters, although only a couple survive this day, of which this seems just a sample of other letters regarding research. In Roeder's letter he notes he is working on an extensive account of his work at the SP Department, however, this work did not survive or at least is not known in any public archive or publication. Roeder wrote:

About the s.Zt. In the Institute for the Study of Certain Psychophysical Problems, which was set up and managed by the OKM, I have put aside all available material in a treatise which will be published in due course. It has become quite extensive, which was also to be expected from the size of the area worked on in the 7 theses of the institute. (Roeder, 1952)

Roeder apparently is investigating characterology using color theory, the diagnosis of personality using color tests. Which was directly derived from Metzger and Muller from above. To which he wrote to Bender about seeking the best advice on these matters.

Hans Roeder to Hans Bender 9/20/1952 :

To make mental states and relationships quantitatively better. I proceeded from man's unconscious relations to the colors, which proved to be a particularly suitable gateway to this new territory.

I have now succeeded in developing a method that allows these relationships to be quantitatively measured. I am therefore able to take Vp's static and dynamic curves over these relationships from the current measurements.

The color measurements are based on the Oswald colors 2,5,8, 11, 14, 1, 20 and 23 of the na series. The measurements taken at 4 Vp's, sometimes over one year daily, combine the 8 colors into 2 bundles whose composition individually curves apart (+ -), keeping separate for a while (2-3 weeks), then approaching, beating into Opposite to (- +) and strive against each other. These reversal periods are always shorter than the normal periods and end with a return to the original state. The 4 colors in the two buds do not run parallel, but swing back and forth in them.

The mashing process is also useful in other unconserved relationships, e.g. To tone, smells, forms, numbers, letters, words, etc. apply, with any combinations can be selected.

Today, I can only circumscribe the very extensive area of research in order to inform you of its presence.

Bender Reply to Roeder 12/9/1952:

The measurement method that you write to me is of great interest to me, but I had to have some documents to comment on. The psychology of colors is actively cultivated in the Institute for Psychology and Characterology of the University of Freiburg, which is led by Prof. Heiss as you probably know unanimously, the so-called color pyramid test (originally from Pfister, Zurich) given to a diagnostic Do you know the test of Luscher, Basel?

It is interesting to see Roder and Bender continuing their war work into the post-war period, does it show conspiracy or just benign research?

Nazi Roots to Soviet Psychotronics

The Nazi Remote Viewing project was not the only project that touched on unconventional science during the Nazi Regime. Serge Kernbach argues that the Soviet psychotronic program likely grew out of captured Nazi scientists that led to the use of hypnosis with remote influencing later in the Soviet Union (see Ch.8), but first crafted in the Nazi regime of Germany:

“For this overview, two of such forced re-settlements in 1945 throughout 1955 are of interest: the first one is related to the institutes in Sinop and Agudzera (close to Suchumi, Soviet Georgia), which was created for Manfred von Ardenne and Gustav Hertz, and directed by them until 1955. These institutes were primarily related to the soviet atomic programs. For technological achievements in this area, von Ardenne received the Soviet Stalin Prize twice in 1947 and 1953, and Hertz got it in 1951. As mentioned by e.g. Heikin, the topics were not only related to atomic research, but also included a number of other issues, e.g. energy convention, high-frequency technics, applied radiophysics, and others. Employees who worked in Agudzera in the 1950s remembered small research groups, which explored ‘hypnosis and weak emissions from biological organisms’. We know that Russian specialists who worked in these facilities in the late 1950s were involved in brain-stimulation programs in the 1960s and 1970s, and later in psychotronic governmental programs in the 1980s. It is well-known that von Ardenne also conducted research related to brain EM-emmission in his laboratory in the late 1920s. Is it possible that works directed in Soviet Georgia by Manfred von Ardenne, Gustav Hertz, Werner Hartmann, Max Steenback (the developer of the first Betatron), and others inspired (or to some extent were used in) early psychotronic research?” (Kernbach 2014)

Kernbach also notes that Czech psychotronic research was begun in the Sudetenland, which was a ethnic German Nazi occupied territory of the Czech nation.

Himmler’s 4th Reich, a Technical State:

As previously noted in the first part of this work Heinrich Himmler foresaw continuing the war indefinitely but through other means as the German Reich was now defeated militarily. To recount in 1943 Himmler began a covert war plan that included setting up covert research facilities in German industries, the creation of political front groups that never publicly mentioned Jews or Racial Supremacy. It is also important to remember the attitude of the SS according to head of the Nazi SS Intelligence Office, Amt. VI, Walter Schellenberg that “if Germany must lose, then let all of Germany die!”, which is eerily reminiscent of the Diplomacy AI in Total War.

Reich Science was overseen by the SS under Heinrich Himmler. What areas of research were they investigating? Surely, they were not reliant on sacred arcs buried in the desert. As we shall read the ideal of using biology on an industrial scale to re-engineer the world in the Nazi image was constructed by Pascual Jordan.

Genetic Engineering for Biological Warfare:

Genetic engineering research was conducted by the Wehrmacht and SS. Genetic Engineering is the science of using engineering in biology usually associated with augmenting or changing DNA, sometimes through a vector such as a bacteriophage or a virus. Changing DNA in this way to change coding of functions or altering of functions (See Krishnan 2017). During the war the Nazis were interested in bacteriophage research.

A bacteriophage, or phage, is a virus that only disinfects bacteria. In Greek, phageton means food/consumption. They are also called bacterial viruses. These are fundamental tools for research and study in molecular genetics. Bacteriophages used among other vectors for cloning and transfer genes. Then Félix d'Hérelle makes the same observation in the stool of patients with bacillary dysentery (bowel disease), isolates the first phages, develops the first therapeutic applications and markets the first bacteriophage drugs. The support of the genetic information (genome) of the bacteriophages can be a DNA or an RNA.

A German researcher on the genetic and biological research of the time notes that the Nazi research was:

Regarding the science in the Reich at this time in this area, Akhim Trunk writes: "Regarding the issue of research, the project was by all means state of the art" (Trunk 2007, 132). The Wehrmacht research was conducted under the auspices of the Kaiser Wilhelm Institute, a scientific research institute with many branches. It was also conducted under the orders of the Reichsführer Heinrich Himmler (Trunk 2007, 122).

As noted above genetic engineering was noted in a 1933 Nazi science conference as being a vehicle for final victory, although deleted from the archive. In what follows is an account of the Genetic Research carried out by the Nazi regime. Though some of this research may or may not be directly related to neuroweapons, their military utilization is the prime motivator in carrying out this research so I note instances of Genetic Engineering below.

One final note regarding bacteriophages is the obvious interest of the Nazi military in such technology. In 1943 Nazi's raid Bacteriophage Researchers in France, imprisoning Eugene Wollman and his wife Elisabeth Wollman. During the 1920s, Eugène Wollman at the Pasteur Institute in Paris attempted to reconcile the views of D'Hérelle and Bordet on bacteriophagy. Wollman posited that the phenomenon was a trait that bacteria acquired through infection or through inheritance. Wollman claimed that lysogenic bacteria involved a form of what he called paraheredity, whereby traits could transmit both vertically, through the genetic material passed from parent to offspring, and horizontally, through genetic material transmitted by infection within the same generation. To test his theory, Wollman conducted experiments on the

bacterium, *Bacillus megatherium* (*B. megatherium*), with his wife Elisabeth Wollman. They published several papers on this work between 1925 and 1940. Their work on lysogeny included the experimental replication of bacteriophagy and the production of bacteriophages in non-contaminated bacterial cultures. They also showed that, contrary to d'Hérelle's theory, there were many distinct species of bacteriophages. (Racine, 2014) The Wollmans' work ended in 1943 when the Nazis took them to the Nazi extermination camp in Auschwitz and executed them. Note this work predates that at Cal Tech under Max Dullbreck (1937), a German immigrant to the United States in 1940, post-WWII genetic engineering was centered in Cold Springs Harbor, Long Island, NY down the road from Montauk.

In 1900, Mendel's genetics research is rediscovered by three European scientists, Hugo de Vries, Carl Correns, and Erich von Tschermak. The exact nature of the "re-discovery" has been debated: De Vries published first on the subject, mentioning Mendel in a footnote, while Correns pointed out Mendel's priority after having read De Vries' paper and realizing that he himself did not have priority. De Vries may not have acknowledged truthfully how much of his knowledge of the laws came from his own work and how much came only after reading Mendel's paper. Later scholars have accused Von Tschermak of not truly understanding the results at all.

Genetics in the early days was considered a part of Eugenics, which basically amounted to Race Hygiene, the use of sterilization on undesirables was a common practice, the field of Eugenics was primarily founded in America before the Nazis took up the cause during the Third Reich. Verschuer, like many others, after the war was able to steer clear of Race Hygiene and rebrand himself as a Genetics researcher primarily studying the effects of Radiation on Genes, which reminds one of the use of 'Target-Theory' in early Gene research, such as advocated by Pascual Jordan in his version of Quantum Biology.

History of the KWI

Genetics in Nazi Germany was carried out in terms of scientific research at the Kaiser Wilhelm Institutes. The KWI of Anthropology, Human Heredity and Eugenics was founded in 1927, partially funded by the Rockefeller Foundation, taking its origins from America. Its first director was Eugene Fischer who in 1921 published 'Principles of Human Heredity and Race Hygiene. In 1927 the director of the Genetics Department was Otmar Freiherr (Baron) von Verschuer (16 July 1896 – 8 August 1969), a Dutch noble, who in 1942 was appointed the director of the Institute. It was Verschuer who directed Josef Mengele in human experiments at Auschwitz concentration camp. Another of Verschuer's assistants was Katrin Magnussen, a German-Swede that was a committed National Socialist even after the war.

Josef Mengele (1911-1979) joined Verschuer in Jan. 1937 (Weiss, 650). He previously received a Ph.D in Anthropology from the University of Munich in 1935. He became one of four assistants, to Verschuer at his Institute in Frankfurt, which worked on categorizing people by race, 'racial certificates', based on ancestry or genes. Primarily focused on proving or disproving one was Aryan or a Jew for court cases and other civil matters in the Nazi era. He received a 2nd Ph.D for medicine with the dissertation "kinship examination in Cases of Cleft Lip, Jaw, Palate" in 1939. He was also a captain in the Nazi SS. In 1943 Verschuer encouraged Mengele to be transferred to Auschwitz, where Verschuer used Mengele to acquire specimens for their research from concentration camp victims. He also was responsible for

administering Zyklon B in the gas chambers. In one story of his machine like efficiency he at one point cleared out an entire barracks of women during a Typhus epidemic, exterminating them all, to make room to move other inmates into the desanitized barracks, thus performing a swap of one barracks to the next to create space to sanitize the next barracks. In another example of his machine like reductive thinking he tried to artificially join two twins together by sewing them together, they eventually died of gangrene from the operation.

The twin research was in part intended to prove the supremacy of heredity over environment and thus strengthen the Nazi premise of the superiority of the Aryan race. (Steinbacher, 2005, 114) Nyiszli and others reported that the twin studies may also have been motivated by an



intention to increase the reproduction rate of the German
(Joseph Mengele during the war, Wikicommons Image)

race by improving the chances of racially desirable people having twins. (Lifton, 1986, 358-9). At Auschwitz he was involved in the following studies that directly informed Verschuers research goals at the KWI-A: Projekt Augenfarbe (Eye study), Zwillingsforschung (Twin Studies), Projekte Eiweißkörper und Tuberkulose (protein study and tuberculosis).

It is notable that he escaped detainment after the war under questionable circumstances raising the spectre of collaboration with Allied security forces. He eventually resettled in South America, at one point being reunited with his family, and visiting West Germany while being hunted by anti-Holocaust activists, West German 'Intelligence' and Israeli Mossad. While in South America he continued his Twin studies, in Candido Gadol in Brazil, creating a number of twins of Germanic ancestry.

Another Verschuier assistant was Karin Magnusson. She received her doctorate in 1932 from University of Gottingen. She studied at the Zoological Institute of the university after receiving her Ph.D. She then became a teacher, a profession she returned to after the war, even though

remaining an avowed Nazi. In 1935, she was connected to the Nazi Racial Policy Office for Hanover. In 1936, she wrote 'Race and Population Policy Tools'. In 1941, she stopped teaching after receiving a scholarship to the KWI-A. There she worked in the Department of Experimental Pathology of Heritage under Hans Nachtsheim. She studied inheritance of eye color in rabbits and humans, drawing the conclusion that eye color is genetically selected and also by hormones. At one point injecting Adrenaline into the eye samples she received from Mengele from Auschwitz to change their eye color (Hesse, 2001, 78), she met Mengele in 1943 at the KWI-A. One area she studied specifically was heterochromia iridum, in which the eye color is different between each eye of a person.

Magnussens, completed research was published in 1949, being entitled "On the relationship between histological distribution of pigment, Iris color and pigmentation of the eyeball of the human eye." (Schmuhl, 2005, 490). It is not hard to extrapolate why racial supremacists fixated on eye color for genetic research, although there may be more to the eye studies than just simple genetic research. The use of hormones and the attempt to try to change the eye color is an interesting aspect of this research, as noted the study of hormones not only is limited to this study but was also involved in other studies by the Nazi scientists.

In 1939, von Verschuer was approached by the German biochemist, Adolf Friedrich Johann Butenandt (1903-1995) who had one the Nobel Prize in Chemistry in 1939 for his work on sex hormones. Adolf Windaus and Walter Schöller advised him to work on hormones extracted from ovaries. This led to the discovery of estrone and other primary female sex hormones, this work was conducted in 1934 in Gdansk at the Chemisches Institut, extracting progesterone and testosterone in 1935.

Verschuer as head of the KWI Genetics program was approached by Emil Abderhalden (March 9, 1877 – August 5, 1950) to do blood studies, of which Verschuer would direct Joseph Mengele in lab work for this process among other assistants to Verschuer. Abderhalden did extensive work in the analysis of proteins, polypeptides, and enzymes. His Abwehrfermente ("defensive enzymes") theory stated that immunological challenge will induce production of proteases. This work was to be used to racially classify people based on serology.

In October of 1943 - Verschuer, Abderhalden and Butenandt work on joint projects funded by the Wehrmacht. Verschuer working with Abderhalden begins studies on Human Blood. Mengele takes over 200 blood samples from Auschwitz prisoners, This work is done in conjunction with Butenandt. Several research assistants are used, such as Josef Mengele, Gunther Hillmann, Irmgard Haase. Trunk has postulated that the real work here rather than studying proteases and enzyme reactions was actually:

"According to Isabel Heinemann's estimates- the RuSHA planned to perform race biological examinations on about 2 million people. Thus, seen in the context of its time, the project represented scientific work profoundly relevant for Nazi racial policy- with potentially extensive, destructive consequences for the people affected by this policy." (Trunk, 2007, 142).

This research of using biology to identify people by not just family but also clan, as well as give a geographical spread to genetic research.

Muller-Hill notes interview with Irmgard Haase:

"Irmgard Haase had spent at first three months with Abderhalden in Halle to learn the defense enzyme reaction in order to analyze the blood of 'gipsy' twins, Russians, Uzbeks, and Kyrgyzstan. In a first step the involuntary blood donors were racial-anthropologically classified: such anthropometric race determinations were required in order subsequently to be able to connect the desired blood analysis results (that is, the race-specific proteins) to a precise type of 'race.' ...From this, blood substrates were obtained, as indicated, for instance from Verschuer's third report to the DFG." (Trunk, 2007, 136)

Verschuer has an ominous tone to his research in which he admits to seeking more than simple genetic racial classification, but how genes influence infection, which obviously is of use to racial classification in Nazism:

Verschuer: "I think that the whole problem is also connected to my research on the issue of heredity of specific proteins. Plasma substrates have been produced from more than 200 people of the most diverse races, twin-pairs and some clans. The Abderhalden method has been exercised and is to be completed with a new method, invented by Hillmann (added on the staff). Hence work on the actual experiment can be started in the next future. My efforts are no longer aimed at establishing the impact of hereditary influence on some infectious diseases, but how it works and what are the processes happening along the way." (Trunk, 2007, 136)

In an even more sinister development within the thought of Mengele is one illuminating entry from his journals that he maintained after the war in South America, he writes:

"Everything will end in catastrophe if natural selection is altered to the point that gifted people are overwhelmed by billions of morons," he warns, predicting that 90 percent of humans will starve due to stupidity and the remaining 10 percent will survive "like reptiles survived. The rest will die, just like the dinosaurs did ... we have to prevent the rise of the idiot masses," he writes.

"The feeble-minded person ('village idiot') was separated from farmers because of his social status and low income," he writes.

"This separation is no longer the case in the age of technology. He is now on the same level with the farmer's son who went to the city.

"We know that selection rules all nature by choosing and exterminating ... Those who were unfit had to accept the rule of more accomplished human beings, or they were pushed out or exterminated. Weaker humans were excluded from reproducing. This is the only way for human beings to exist and to maintain themselves."

He says "inferior morons" should be exterminated, adding, "We have to make sure that nature's suspended eradication will continue through human arrangements ... birth control can be done by sterilizing those with deficient genes." (Aderet, 2010)

Putting the genetic research and engineering in perspective with Mengele's own admission of "90% of the earth's population will die in a catastrophe" with the purpose of using molecular biology to identify people by race and clan, it is a question as to whether this research was a form of a "Final Solution", leaving the mythical 'Aryans' to rule the world as lone survivors of biological warfare.

Berlin Brain Institute, Biological Research in Nazi Germany

It is interesting to take note regarding the various different KWIs in Germany dedicated to studying biology and genetics

- Adolf Butenandt Director KWI for Biochemistry in 1937 D
- Helmut Doring KWI for Breeding Research conducted mutation research.(Deichman 1996)

Virus research, the leaders of KWIs agreed to conduct research in this area:

- Alfred Kuhn, Biology and Biochemistry
- Adolf Butenandt, Biochemistry
- Fritz von Wettstein, Biology

Germany created the KWI Division for Virus Research, with funding from Heinrich Horlein of IG Farben. "From 1937 on, Gustav Adolf Kausche, head of the laboratory for experimental virus research on the Reich Biological Institute, together with E. Pfankuch carried out mutation experiments by using radiation on a TMV dry specimen from Stanley, on their own TMV specimen, and on the x-potato virus." (Deichman, 1996, 210-1)

In 1943 the SS established its own institute for plant genetics (Deichman, 1996, 217)

"The basic research in genetics at this Kaiser Wilhelm Institute [Breeding Research] consisted primarily of mutation research, which after Stubbe's dismissal was carried on by his successor Edgar Knapp. Knapp induced mutations in mosses through X-rays and UV radiation. During the radiation of moss spermatozoids with monochromatic UV light, he discovered in 1939, together with A. Ruess, Otto Risse, and Hans Schreiber, that the radiation showed the greatest mutagenic effect in the range of the spectrum – 265 micrometers Terahertz radiation occupies a middle ground where the ranges of microwaves and infrared light waves overlap - that corresponded to the absorption maximum of DNA.... Knapp and his colleagues merely concluded that thymonucleic acid (the term for DNA at the time) had a decisive importance for genetic and physiological

changes through radiation, and that the relationship between 'thymonucleic acid and the genetic substance proper' had to be left to further studies." (Deichman, 1996, 219)

KWI for Brain Research at Berlin-Buch and Biological Weapons Development

The KWI Brain Research Genetics Department established by Timofeeff-Ressovsky in 1925 in Berlin. The KWI Brain Institute was notably the place where the greats of molecular biology worked together: Delbruck, Zimmer, T-R, and Pascual Jordan, the physicist. It is interesting that America tried to recruit T-R to head up their research in the States, but eventually landed Max Delbruck, who worked at Cold Springs before going to California., "In 1936, after the Reich Education Minister had increased the budget of his department, Timofeeff-Ressovsky turned down an offer from the Carnegie Institution to go to Cold Spring Harbor in the United States." (Deichman, 1996, 221) The research purpose: "in his working report to the DFG in 1938, Tomofeeff-Ressovsky listed the following as the general research task of the department: the phenomonology of gene manifestation, experimental mutation research, and population genetics, with the main focus of the last two fields". (Deichman, 1996, 221-2) Fund from the RFT and the Philips Company were used in 1938 to set up a biophysical laboratory in the deparment with apparatuses for radiobiological and readiophysical experiments, among them a powerful neutron generator, a linear accelerator for more effective generation of neutron radiation." (Deichman, 1996, 222) [see Zimmer nueutrino studies, around this time Zimmer is professionally employed by KWI] After Huermann Muller's discovery in 1927 of the artificial induction of mutations through X-ray radiation, scientist were hoping to get closer to the nature of the gene by analyzing the mechanisms of the induction of mutations. For a number of years mutation research became the most modern- the most strongly funded and most widely purseued-- field of genetic research. Mutations were induced by X-ray, UV, and neutron radiation. The few experiments that were carried out at this institute with chemicals produced no evidence of chemical mutagenesis." (Deichman, 1996, 222)

Genetic mutation research is of course of interest to supporters of eugenics, as America was the major center of this research it is not suprising research funding came from America and sought to move the most advanced researchers to America. "In 1937 Delbruck received a grant form the Rockefeller Foundation to carry out genetic research under Thomas Morgan at the California Institute for Technology. Delbruck moved to the United States and in 1939 decided to stay. Shortly thereafter he shifted to genetic research in phage." (Deichman, 1996, 223)

Jordan was an advocate of Target Theory early on, this was also reflected by Zimmer and Delbruck, "In their work on gene mutation and gene structure, T-R, Zimmer and Delbruck applied the target theory of the effect of radiation to the action of radiation in genetics. The Target theory was formulated in 1922 by Friedrich Dessauer as a mathematical description of the biological effects of radiation and was given specific form in 1924 by James Crowther. T-R, Zimmer and Delbruck reached the conclusion that a mutation represented a one-hit result that came about through a single, radiation-caused ionization in a hit area, the gene." (Deichman, 1996, 223) Jordan belief about molecular resonance: "However, in contrast to Delbruck, Jordan was not planning any experiments but deduced from quantum mechanics theoretical conclusions for biological problems. Based on quantum mechanics, he posited an attractive

power between identical macromolecules (“quantum mechanical resonance attraction”, and with it he tried to explain not only the attraction of homologous chromosomes but also the self-replication of ‘genes and virus molecules’. He argued that during replication similar molecules were built, the atoms of which were quantum-mechanically in different states.” (Deichman, 1996, 224) [he was wrong as far as protein synthesis, but was right in other particular areas and led to the Cosmic Resonance theory] of course Jordan was influential on other members of the research team he interacted with, “There is reason to believe that the intense contact with Jordan contributed to Timofeeff-Ressovsky’s decision to make the analysis of the primary process of mutation into one of his main areas of research. According to Jordan, many biological reactions, especially biological radiation effects (mutations) were microphysical reactions in the quantum-mechanical sense. He saw a phenomenon of quantum mechanics specifically in the movement of the energy released by ionization somewhere in the hit area to the place where it was used for the change of the gene molecule: electrons did not wander in the normal sense of the word but spread over a molecule like a wave (Jordan 1940).” (Deichman, 1996, 225)

Again, we see how Himmler was influential on this kind of research, “The scientific interests and personality of Heinrich Himmler (1900-1945) largely shaped the goals of the science policy of the SS as well as the practical content of the scientific and medical research it initiated.” (Deichman, 1996, 251) On July 7th, 1942 Institute for Practical Research in Military Science, set up within SS Das Ahnenerbe. The Dachau experiments of Eduard May were conducted under this institute. Kurt Blome, Project Paperclip scientist brought to America, also worked under this institute. (see Deichman, 1996, 279) and had 5 science divisions and two medical divisions. “The informal working group for the study of biological weapons, established in 1940, was renamed the working group Blitzableiter and given the official responsibility by the high command of the Wehrmacht for research into biological warfare, which by Hitler’s order was intended to be only defensive.” Interesting to note that Himmler wanted to develop offensive biological weapons in contrast to Hitler. (Deichman, 1996, 279) Support for attacking America with bioweapons was encouraged, “[Ministerial Manager for the Science Section of the Wehrmacht, Erich Schumann] We must not watch heedlessly but must also prepare for the large-scale use of biological weapons. In particular, America must be attacked simultaneously with various human and animal epidemic pathogens as well as plant pests. (Deichman, 1996, 280) “On Goering’s instruction and with strong support from Himmler, Blome in 1943 set up an institute for the testing of biological weapons on the grounds of the former monastery of Nesselstedt near Posen.” (Deichman, 1996, 282) [also included a Pharmacological division in Kleist barracks in Posen] “The biological weapons studied in Posen included plague bacteria. Research into the use of these bacteria as a warfare agent seems to have been one of Himmler’s main interests since 1944. According to investigations by the American secret service, Himmler has ordered that biological warfare research be conducted more offensively and to that end had offered Blome the opportunity of using a concentration camp for studies on the plague.”. (Deichman, 1996, 284)

Karl Gunther Zimmer contributions to molecular biology:

It is worth being aware of the work of Zimmer as he was instrumental in the science of genetic mutations caused by radiation and also taken as a prisoner to the Soviet Union where remote influencing work was studied. The following is a brief account of his contributions to the microbiology.

“On the Nature of Gene Mutation and Gene Structure” – this was the title of a paper published in June 1935 that was to have a great impact on early molecular genetics. Long known as the “Green Pamphlet” or the “three-man-paper”, it has now attained cult status. The paper originated mainly in Berlin-Buch. The authors of this paper were the geneticist Nikolai Vladimirovich Timoféeff-Ressovsky (1900-1981), the radiation physicist Karl Günther Zimmer (1911-1988) and the theoretical physicist Max Delbrück (1906-1981). Each author was singly responsible for one of the first three parts of the paper (Timoféeff-Ressovsky: Some Facts from Mutation Research), (Zimmer: The Target Theory and Its Relation to the Triggering of Mutations) and (Delbrück: Atomic-Physics Model of Gene Mutation). The fourth part, the conclusion (Theory of Gene Mutation and Gene Structure), was written jointly. In the conclusion the authors stated: “*We view the gene as an assemblage of atoms within which a mutation can proceed as a rearrangement of atoms or a dissociation of bonds (triggered by thermal fluctuations or external infusion of energy) and which is largely autonomous in its operations and in relation to other genes.*” The remarkable reception the paper received was mainly due to the detailed presentation of it by Erwin Schrödinger (1887-1961) in his 1944 book *What is Life?* (Wunderlich, 2011)

Karl Gunther Zimmer Timeline:

One of the early innovators in microbiology, worked on nuclear radiation and cancer. Co-authored the Green pamphlet or three man paper with Timofeeff-Ressovsky and Delbruck.

“We view the gene as an assemblage of atoms within which a mutation can proceed as a rearrangement of atoms or a dissociation of bonds (triggered by thermal fluctuations or external infusion of energy [radiation]) and which is largely autonomous in its operations and in relation to other genes”. (Wunderlich, 2011)

Zimmer’s part of the three man paper addressed “The Target Theory and its Relation to the Triggering of Mutations”

1934 Habilitation Institute Radiation Research of the Berlin School of Medicine

1933 began collaboration with Timofeeff at Berlin-Buch Brain Institute

1937 paid staff member of Timofeeff’s team in the Department of Genetics

1939 pioneering work in neutron dosimetry

1944 published with Timofeeff ‘The Hit Principle in Biology’. British physicist Douglas Lea wrote a similar book but rather on the hit area, the ‘target’ theory, was in regular correspondence with Zimmer.

As part of the German scientific war efforts, was required to submit reports to the Reich Research Council, classified as secret. Some of the reports were 'Report on studies of the relative effectiveness of X-rays and fast neutrons with regard to the generation of chromosomal mutations' they were under the Nuclear Physics Research Reports, an internal, top-secret publication series of the German Uranium Society.

1945 – at end of war, briefly worked for Auer Company, which supplied nuclear fissionable material to the Nazi war machine. Upon Soviet occupation was taken to the Soviet Union as a imprisoned scientist to work on Soviet Nuclear projects.

1948 – Jordan, Pascual, Karl Günther Zimmer, Nikolai V. Timoféeff-Ressovsky (1948) Über einige physikalische Vorgänge bei der Auslösung von Genmutationen durch Strahlung II [On some physical processes involved in the induction of gene mutations by radiation II]. *Zeitschrift für Vererbungslehre* 82: 67-73.

1955 – returned to Germany, habilitation from U. of Hamburg, appointment to Professorship in Heidelberg.

1957 – at Heidelberg heads research institute:

Already in the Green Pamphlet the question was raised about the processes that are initiated by the localized supply of energy in biological material, which is associated with the absorption of radiation. Zimmer had barely arrived back in “normal” research operations, when he succeeded in 1957 together with the brothers Lars and Anders Ehrenberg in making a spectacular finding: Using electron spin resonance spectroscopy, the researchers for the first time detected the formation of free organic radicals on living material following irradiation.⁶⁷ Thus, a new field of research was opened, which Zimmer and his team worked on intensively in the following years in Karlsruhe. First and foremost, bacteriophages were used as biological models. The numerous further studies at the Karlsruhe Institute cannot be discussed further here. Among the approximately 550 publications that have emerged from the Institute of Radiation Biology under Zimmer’s directorship until his retirement in 1979, many were on the effects of radiation on enzymes (using the example of ribonuclease), on the characterization of primary chemical reaction products in irradiated DNA and on the effect of radiation-damage on the matrix function of DNA. Research was also pursued on radiation-induced energy transfer through elastic nuclear collisions. Zimmer rarely appeared as co-author of the original papers of his staff. Instead he wrote many overview articles that are still worth reading today. (Wunderlich, 2011)

1958 – with support from Pascual Jordan, Abderhalden and Baron von Verschuer appointed a regular member of the Academy of Sciences and Literature.

Wunderlich remarks on Zimmer’s career:

The life and work of Karl Günther Zimmer is remarkable for a number of reasons.

1. Zimmer belonged to the first generation of physicists who sustainably changed biology. The geneticist Guido Pontecorvo (1907-1999) described this as follows: “*In the years immediately preceding World War II, something new happened: the introduction of ideas*

(not techniques) from the realm of physics into the realm of genetics, particularly to the problems of size, mutability, and self-replication of genes. The names of Jordan, Frank-Kamenetski, Friedrich-Freksa, Zimmer, and Delbrück, with Muller and [sic] Timofeef-Ressovsky as their biological interpreters, are linked to this development. [...] The debt of genetics to physics, and to physical chemistry, for ideas began to be substantial then, and it has been growing steadily all the time." Five of the seven scientists mentioned above worked for a time in Berlin-Buch, a sixth (Friedrich-Freksa) worked in Berlin-Dahlem.

2. As co-author of the Green Pamphlet Zimmer's name is inseparably associated with the early history of molecular biology.
3. Zimmer was one of the founders and protagonists of quantitative radiation biology. This was based on his pioneering solutions of dosimetric problems.

(Wunderlich, 2011)

Notes:

[1] the Krupp connection is interesting. The original backer of Vogt, killed himself after being revealed as being a homosexual. His son-in-law took over the company, Gustav von Bohlen und Halbach, who helped finance Hitler. His son Alfried Felix Alwyn Krupp von Bohlen und Halbach, oversaw the company through WW II. Later family control passed on to a Foundation (Stiftung) which was placed under the supervision of Herman Josef Abs (Deutsche Bank AG) who headed things up in Hamburg, who is spoken of as overseeing financial affairs for the Hamburg centered advocates for a 4th Reich. Nonetheless, we see a pattern of support for Brain research among extreme right wing politicians and industrialists, even though Vogt was a socialist. Later Krupp merged with Thyssen forming Thyssen-Krupp.

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