# AUTO NOMI JE

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# AUTONOMIJE

**SADRŽAJ**

# *Autonomije*

Projekat *Autonomije* je poslednje 3 godine kroz različite istraživačke i reprezentativne forme obuhvatio polje automatizacije i autonomizacije. Zamišljen kao istraživački, projekat je na početku imao cilj da istraži realnosti i mitologije mašinske (algoritamske) autonomije u različitim savremenim ontologijama i ekologijama. U javnom diskursu je sve prisutniji kontekst autonomnih mašina koje na ovaj ili onaj način preuzimaju funkcije koje su do sada smatrane isključivo ljudskom. Tokom tog procesa cilj projekta se modifikovao i delom proširio na pitanja opštih tehnoloških uslova postojanja i na probleme tzv. opšte ekologije, tj. ideji mnogostrukih ekologija koje su podstaknute krizom antropocentričnog diskursa. Kao rezultat prvih kibernetičkih utopija pedesetih i šezdesetih su prvenstveno u SAD, desio se razvoj centara i laboratorija koje su za cilj imale istraživanja veštačke inteligencije. Tadašnji entuzijazam je nakon nekog vremena splasnuo usled kompleksnosti celog projekta stvaranja i operativnosti veštačke inteligencije (posebno tzv. hard AI). Posle nekoliko uspona i zatišja u razvoju veštačke inteligencije, poslednjih godina su neki postulati veštačke inteligencije počeli da se pojavljuju pa i primenjuju u široj upotrebi, čemu je pored dugogodišnjeg istraživanja doprineo i mnogostruko veći računarski kapacitet i snaga. Ideju potpune automatizacije i mašinske autonomije je često pratila mistifikacija i mitologizacija, pa su i neuspesi u "dostizanju" veštačke inteligencije uvek bili rado dočekivani od tehno distopista i kritičara kao dokaz da je cela ideja naduvani balon i u osnovi nemoguća za realizaciju, bar na onaj način kako su to zamišljali tehnoentuzijasti. Sa druge strane dostignuća u robotici, mehatronici i razvoj kompjuterske snage su doprineli određenim pomacima koji se mogu prepoznati kao deo nečega što bi se moglo nazvati mašinskom autonomijom. Samim tim nameće se pitanje koje su društvene, političke, ekološke pa i ontološke posledice tehnološkog razvoja?

Ideja "Autonomija" u tehnizovanoj okolini propituje (ne)mogućnosti autonomije i osnovne dihotomije, sa jedne strane vinerovske kibernetičke povezanosti, i sa druge simondonovske konstantne individuacije. Tekstovi u publikaciji su pregled nedavnih istraživanja u oblasti koja bi se mogla nazvati ontologijom tehnologizovanih ekosistema.

Kao jedan od ključnih tekstova se pojavljuje tekst Žilbera Simondona (Gilbert Simondon) *Tehnički mentalitet* u kome on pored ostalog tvrdi da tehnički objekt nije predmet istorijske posledičnosti, već je tehnički objekt kao tehnička inovacija autonoman i ima apsolutno poreklo. Tehnički objekt nije proizvod slučajnosti već sopstvenog uslovljenog pojavljivanja.

Erich Hörl u tekstu *Hiljadu ekologija* problematizuje fenomen okolinjaštva (environmentality) i umnožavanja ideja ekologija koje on povezuje sa sve većom tehnizacijom i "Bićem u tehnološkim uslovima". Takođe on opisuje i Hajdegerovu nemogućnost predstave kibernetskog spoja ljudi,

živih bića i tehnologija, zbog Hajdegerovog u suštini ipak antropocentričnog pogleda (iako je u suštini bio kritičar humanističkog diskursa).

U tekstu *Ono čemu se odupireš istrajava: Automatizacija, automatizam i autonomizacija* Atnhony Iles piše između ostalog i o autonomizaciji procesa akumulacije kapitala koji teče paralelno sa autonomizacijom i tehnološkom automatizacijom. On autonomizaciju dovodi u direktnu veze podele rade u tejlorizmu, kada podela rada, razdvajanje različitih nivoa u proizvodnji, tj. autonomizacija sama postaje metod masovne proizvodnje. Ilesov tekst iako se osim određenih referenci ne bavi detaljno tehnološkom automatizacijom i autonomizacijom, doprinosi problematizovanju pitanja generalne kompartmentalizacije.

U zbirku tekstova je uključen i deo knjige "Zarazna arhitektura: računanje, estetika i prostor" Lucijane Parisi, konkretno članci Kibernetska misao i Ekološka misao iz poglavlja 3. pod nazivom "Arhitektura misli". U knjizi Parisi tvrdi da algoritamsko računanje nije samo matematički alat već posebni misaoni model čija apstrakcija i sve već složenost izlazi van okvira ljudskog razumevanja. Ovi modeli mišljenja iako podstaknuti od strane čoveka, imaju tendenciju za autonomijom u odnosu na čoveka.

U tekstu Haos u Mavau: *Slučaj „Flash crash"; ili forenzička reperformansa u dubinama vremena* Gerald Nestler nam kroz mnoštvo primera pokazuje kako automatizovani algoritmi na berzama brzinom svojih operacija onemogućavaju ljudski faktor ne samo iz taktičkog odlučivanja o kupovini i prodaji već ozbiljno otežavaju retroaktivno, ispitivanja algoritamskih operacija. Nestler piše o kompleksnosti forenzičarskog putovanja u mikroprošlost berzanskih visokofrekventnih i ultra brzih operacija.

*Kristian Lukić*

# Tehnički mentalitet[1]

Ovaj rad ne bavi se ontologijom, već aksiologijom. On pokušava da pokaže kako postoji tehnički mentalitet, da se taj mentalitet razvija, i da je prema tome nepotpun i u opasnosti da postane prerano shvaćen kao monstruozan i neuravnotežen. To zahteva preliminarni stav velikodušnosti prema poretku stvarnosti koji on pokušava jasno pokazati, zbog toga što ta nepotpuna geneza uvodi u igru vrednosti koje opšte odbijanje [takvog mentaliteta] može proterati u neznanje i rizikovati njihovo poricanje.

Pokušaćemo pokazati da tehnički mentalitet jeste koherentan, pozitivan, i produktivan u području saznajnih shema, ali nepotpun i u konfliktu sa samim sobom u području afektivnih kategorija zato što se nije već pojavio na odgovarajući način; i konačno, da je on bez jedinstva i da ima biti gotovo potpuno konstruisan unutar voljnog poretka.

**I Saznajne sheme**

Teorijsko područje prvi put se pojavilo u zapadnim civilizacijama, tu je po prvi put bilo teoretizovano, sistematizovano i formalizovano. Ono je vodilo ka proizvodnim konstrukcijama i ono samo po sebi predstavlja metod otkrivanja i interpretacije koji može biti uopšten. U tom smislu, tehnički mentalitet nudi način znanja *sui generis* koji suštinski koristi prenos po analogiji i paradigmu, i temelji se na otkriću zajedničkih načina funkcionisanja – ili režima operacije – u inače različitim poretcima realnosti koji su odabrani podjednako iz živog ili inertnog, kao i iz ljudskog ili neljudskog.

Ostavljajući antiku po strani,[2] tehnologija je već dala najmanje dve vrste shema razumevanja koje su obdarene  latentnom moći univerzalnosti: naime, u formi Kartezijanskog mehanizma i u formi kibernetičke teorije.

U kartezijanskom mehanizmu, osnovni rad jed-

nostavne mašine analogan je sa funcionisanjem logičke misli sposobne da bude rigorozna i produktivna. Jednostavna mašina je sistem prenosa koji u određenom slučaju u kome se pretpostavlja da je kretanje reverzibilno, u stanju ekvilibrijuma, uspostavlja identitet rada koji nešto stavlja u pokret i rada koji se odupire tome. Ako svaki deo mašine učestvuje u tom prenosu rigorozno, broj delova može biti bilo koliki; ono što se menja samo je smer sila – kao sa čekrkom – ili faktora (sile ili pokreta) proizvoda koji ostaje konstantan, kao u slučaju čekrk-blokova. Racionalni mentalni proces svodi suštinu uobičajenih tehničkih objekata na ovu  shemu prenošenja: lanac je jedno ulančavanje karika, tako da je druga karika fiksirana za prvu isto kao što je prva fiksirana za učvršćeni prsten. Prenos sila ide od karike do karike, tako da je svaka karika zavarena dobro i bez prekida u ulančavanju, poslednja karika pričvršćena je za učvršćenu tačku, na posredniji, ali takođe i rigorozniji način nego prva. Građenje, kamen po kamen, red po red, u prenošenju „certum quid et inconcussum", -- otpor kamena temeljca – celim putem do vrha, kroz sukcesivne nivoe od kojih se svaki ponaša kao temelj za sledeći viši nivo.[3] Takvo razumevanje prenosa bez gubitaka koje mehanizuje idealno i analogno (ali  takođe u realnosti, zahvaljujući kartezijanskoj koncepciji znanja) sve modalitete stvarnosti, primenjuje se ne samo na RES EXTENSA već takođe i na RES COGITANS: „dugi lanac razloga" nosi „prenošenje dokaza" od premisa do konkluzije, baš kao što lanac prenosi sile od ušvršćene tačke do poslednje karike. Pravila metoda nisu inspirisana samo matematikom; ona se takođe potpuo uklapaju sa različitim nivoima proizvodnje i tehničke kontrole. Misao potrebuje sidrišnu tačku koja je operativni ekvivalent kamena pod građevinom, ili prstena koji je zakačen na početak lanca: *certum quid et inconcussum: jasno je* šta ostaje posle svih pokušaja dekonstrukcije, čak i

posle hiperboličke sumnje. Izvođenje rezonovanja zahteva jednu analizu—podela poteškoće na što je više moguće delova i onoliko koliko je potrebno kako bi se ona bolje rešila—jer svaki deo intelektualne montaže mora igrati jednostavnu, univokalnu ulogu—kao kotur poluga čija je mehanička funkcija u celosti jednostavna i savršeno jasna. Treće pravilo (sinteze ili poretka) jeste uređivanje prema shemi potpuno ujedinjene celine mašine. Konačno, četvrto pravilo, kontrole, jeste ujedinjenje postavljanja različitih delova i prilagođavanje mašine dvema realnostima na oba kraja lanca.

Ono što je izvedeno kako u racionalnom proučavanju mašina, tako i u mišljenju jeste *prenos bez gubitaka:* nauka i filozofija moguće su zato što prenos bez gubitaka jeste pretpostavljen kao moguć. Stoga, jedina područja kojima se može pristupiti filozofskom refleksijom jesu ona sa kontinuiranom strukturom. Te će prema tome biti jasno zašto bi neko želeo shvatati ljudska bića kao mašine: ako ona nisu mašine *ontološki,* ona imaju biti takva najmanje *po analogiji* kako bi bila objekti nauke.

Kibernetika, koja je rođena iz matematizacije automatskih regulacionih aparata [dispositifs] – posebno korisnih za konstrukciju automatske opreme aviona u letu- uvodi u ovo stalno vraćajući cilj informacije na relejima aparata kao osnovnu shemu koja dozvoljava aktivno prilagođavanje spontanom finalitetu. Ova tehnička realizacija finalizovanog izvođenja služila je kao model razumljivosti za studije velikog broja regulativa—ili propusta regulacije—u živome, kako ljudskom tako i neljudskom, kao i fenomenima podložnim postajanju, kao što je ekvilibrijum vrsta između grabljivaca i plena, ili geografskih i meteoroloških fenomena, varijacije nivoa jezera i klimatskh režima.

U tom smislu, tehnologija u sukcesivnim talasima manifestuje moć razumevanja po analogiji koja je *sui generis*; naravno, to nije  uokvireno granicama

reparticionisanja suština ili područja stvarnosti. To ne pribegava kategorijama, ostavljajući po strani generičke relacije, posebne relacije, i specifične razlike. Nijedna od shema ne iscrpljuje područje, ali svaka od njih računa sa određenim brojem efekata u svakom području, i dozvoljava prolaz od jednog područja do drugog. To transkategoričko znanje, koje pretpostavlja teoriju znanja koja bi bila bliski rođak istinskog realističnog idealizma,[4] posebno je prikladno za osvetljavanje univerzalnosti načina aktivnosti, režima rada; ono ostavlja po strani problem atemporalne prirode bića i modaliteta realnog; ono se primenjuje na njihovo funkcionisanje; ono tendira ka fenomenologiji režima aktivnosti, bez jedne ontološe pretpostavke koja je bliska prirodi onog što postaje aktivno. Svaka od shema primenjuje se samo na određene režime svakog regiona, ali ona može u principu da se primeni na svaki režim svakog regiona. Primena takvih shema razumjivosti zahteva dva osnovna uslova, koji mogu biti prikazani kao postulati „tehničkog mentaliteta":

1. *Podsetovi su relativno odvojivi od celine čiji su deo.* Ono što tehnička delatnost proizvodi nije apsolutno nedeljivi organizam koji je metafizički jedno i nedeljivo. Tehnički objekat može biti popravljen; on može biti dovršen; jednostavna analogija između tehničkog objekta i živog je pogrešna, u smislu da u momentu njegove same konstrukcije, tehnički objekat jeste shvaćen kao nešto što može potrebovati kontrolu, popravku, i održavanje, kroz testiranje, modifikaciju, ili, ukoliko je neophodno, kompletnu promenu jednog ili nekoliko subsetova koji ga sačinjavaju. To je ono što nazivamo anticipiranim "maintenance", da upotrebimo Anglo-Saksonski termin.
Ovaj postulat je izrazito važan kada se pitamo o načinu na koji možemo pristupiti živom biću, ljudskom biću, ili instituciji. Holistički postulat, koji je

često predstavljen kao držanje sa poštovanjem spram života, osobe, integriteta tradicije, možda je samo lenji način da se izađe odatle. Prihvatiti ili odbaciti bivanje celovitim, jer je to celo, znači možda izbeći prilagođavanje spram njega da bi se zauzeo velikodušniji stav: naime, to je stav pažljivog ispitivanja. Istinski tehnički stav bio bi više rafinisan nego laki fundamentalizam moralnog suda ili pravde. Distinkcija između podsetova i načina njihove relativne solidarnosti bila bi prema tome prva mentalna radnja koja je mišljena od strane saznajnog sadržaja tehničkog mentaliteta.[5]

2. Drugi postulat je postulat nivoa i režima: *ako želimo potpuno da razumemo biće, moramo ga proučavati uzimajući ga u obzir u njegovoj entelehiji, a ne u neaktivnosti i statičnom stanju.*
Većina tehničkih realiteta su subjekti postojanja praga za pokretanje i održavanje njihovog funkcionisanja; iznad ovog praga, oni su apsurdni, samo-destruktivni; ispod njega, oni su samo-stabilni. Veoma često, pronalazak se sastoji od pretpostavljanja uslova njihovog realizovanog funkcionisanja—u pretpostavljanju da je problem praga rešen. To je razlog tome što većina pronalazaka prolazi kroz kondenzaciju i konkretizaciju, redukovanjem broja primitivnih elemenata na minimum, koji je u isto vreme jedan optimum.[6]
Takav je slučaj, na primer, sa Ledukovim nabojnomlaznim motorom: na zemlji, to je skoro jedna apsurdna struktura, nesposobna da obezbedi potisak u određenom smeru: ali počinjući od određene brzine kretanja, on postaje sposoban održavati svoju brzinu—drugim rečima, potiskuje napred—i koristi raspoloživu energiju za pokret.
GUIMBAL grupa—koja se u potpunosti održava u prisilnom ponašanju brane—izvorno se činila apsurdnom. Alternator je tako malih dimenzija da se čini kako će armature biti uništene od strane Džulovog

efekta. Ali upravo je stvar u tim malim dimenzijama koje omogućavaju da alternator bude smešten potpuno unutar kanalizacije, na samoj osovini turbine. To osigurava hlađenje koje ima značajno veći efekat nego ono u slučaju alternatora postavljenog u vazduhu. Takav raspored omogućen je postavljanjem alternatora u futrolu punjenu sa uljem, koja pojačava izolaciju i poboljšava termalnu razmenu, dok osigurava podmazivanje različitih nivoa i sprečava vodu da uđe unutra: ovde, multifunkcionalni karakter ulja u futroli jeste sama shema koncentracije koja čini da pronalazak prostoji, kao režim funkcionisanja. Moguće je po analogiji anticipirati postojanje, unutar različitih poredaka realnosti, određenih *efekata* (termin se ovde koristi u smislu izražavanja „Ramanovog efekta", „Komptonovog efekta") koji za njihovo postojanje potrebuju prelazak određenog praga. Ti efekti nisu strukture; oni su različiti od tih struktura u tome što potrebuju prag koji treba biti pređen. Motor sa unutrašnjim sagorevanjem koji je isključen u stabilnom je stanju i ne može uključiti samog sebe; on potrebuje određenu količinu energije koja dolazi spolja, treba da primi određenu ugaonu brzinu kako bi dosegao prag samoodržavanja, prag preko koga funkcioniše po režimu automatizma, gde svaka faza ciklusa priprema uslove za upotpunjavanje sledeće faze. Iz tih novih zapažanja, mi možemo zaključiti kako tehnički mentalitet već nudi koherentne i upotrebljive sheme za saznajno tumačenje. Sa kartezijanskim mehanizmom i kibernetikom, već uveliko je uveo dva misaona pokreta; ali u slučaju kada postoji svesnost sistematske upotrebe dva postulata koje smo prikazali gore, takođe se pojavljuje kao sposoban da doprinese formiranju većih shema.

## II Afektivni modaliteti

Ova slika, svejedno, postaje mnogo manje jasna, čim pokušamo da analiziramo afektivne sadržaje. U ovom slučaju, nailazimo na antagonizam između zanatskih i idustrijskih modaliteta, antagonizam koji je uparen sa nemogućnošću potpunog razdvajanja ova dva aspekta. Nostalgija zanatlije prelazi ne samo preko industrijskog života proizvodnje, već takođe preko različitih dnevnih režima potrošnje dobara koja dolaze iz industrijskog sveta.

Teško je svesti gomilu savršeno koherentnih i ujedinjenih osobina na suprotnost između zanatskog i industrijskog modaliteta kada hoćemo položiti račun o genezi afektivnih modaliteta. Kako bilo, mi ćemo predložiti kriterijum koji, posle nekoliko pokušaja, izgleda ponajmanje problematično: u slučaju zanatlije, svi uslovi zavise od ljudskog bića, i izvor energije je isti kao i izvor informacija. Oba izvora nalaze se unutar ljudskog operatora; ovde je energija dostupna preko gesta, ona je upotreba mišićne snage; informacija simultano prebiva u ljudskom operatoru kao nešto naučeno, izvučeno iz individualne prošlosti obogaćene obrazovanjem, i kao stvarna upotreba čulnog pribora koji kontroliše i reguliše primenu naučenih gestova na konkretnu materijalnost materijala za rad i na određene karakteristike cilja [rada]. Manipulacija je sprovedena prema kontinuiranim shemama na realnostima koje su iste skale kao i operator. Korelativno, distanca između radnog čina i uslova upotrebe proizvoda rada jeste mala: obućar direktno uzima mere, sedlar zna za kog konja radi; ponavljanje je moguće: brzina sa kojom objekat nastaje, tipovi deformacija proizvoda tokom upotrebe poznati su zanatliji, koji ne samo da konstruiše već takođe i popravlja.

Štaviše, u slučaju zanatlije odnos između ljudskog bića i prirode je trenutan, zato što on leži u izboru materijala i u radu koji je učinjen na njima. U

zanatskom modalitetu, rad je dosetljivost, uređuje i čini da se različiti materijali na kojima se može raditi ponašaju skoro kao primarni materijali, ali koji ostaju bliski prirodnom stanju, kao koža ili drvo. Zanatskom radu uopšte ne prethodi potpuna transformacija primarnih materijala. Poslednje bi zahtevalo ulaganje izvora energije uzetih izvan ljudskog tela. U tom smislu, takva transformacija dolazi—čak i u pred-industrijskom stanju-od jedne industrijske sheme, naime metalurgije, koja je industrijska kroz transformaciju minerala u metale, čak i ukoliko ostaje zanatska zbog načina na koji proizvodi objekte.

Industrijski modalitet pojavljuje se kada izvor informacija i izvor energije bivaju razdvojeni, naime kada ljudsko biće jeste samo izvor informacija, a priroda je ono od čega se zahteva da obezbedi energiju. Mašina se razlikuje od alata u tome što je ona relej: ima dve različite tačke ulaza, jednu za energiju, a drugu za informacije. Fabrikovani proizvod koji donosi, jeste efekat modulacije energije kroz informacije, efekat koji je izveden na materijalu za rad. U slučaju alata, kojim se rukuje, ulaz energije i ulaz informacija je pomešan, i naposletku delimično montiran. Naravno, neko može navoditi dleto skulptora jednom rukom, i gurati ga drugom, ali to je i dalje isto telo koje harmonizuje dve ruke, i jedinstven nervni sistem koji prisvaja njihov pokret u takvom detalju za materijal i za cilj sklopa. Grnčarov posao, koji se pokreće njegovim stopalima, i dalje je iste vrste, ali on dozvoljava da bude anticipirano rođenje mašine. Pravljenje čaša je zanatsko ukoliko onaj koji pravi čaše dobija energiju koja proširuje početni mehur duvanjem, i ukoliko reguliše kroz ritam njegovog duvanja brzinu plastične deformacije stakla. Ali on postaje industrijski kada je energija pozajmljena od kompresora.

Kada pozajmljuje energiju od prirodnog izvora, ljudsko biće otkriva jednu beskonačnu rezervu, i dolazi u posed prilične moći. Za njega je moguće postaviti serije releja, što znači da slaba energija može voditi do upotrebe priličnih količina energije.[7]

Nažalost, *ulaz informacija* koje ulaze u rad nije više unikatan na način na koji je on to bio u zanatskom gestu: to se dešava kroz nekoliko momenata i na nekoliko nivoa. Prvi put se događa sa otkrićem mašine—jednim otkrićem koje ponekad implicira uvođenje u igru značajnih zona znanja i okupljanja velikog broja ljudskih bića. To se događa drugi put sa *konstrukcijom* mašine i sa regulacijom mašine, što su drugačiji načini delatnosti od upotrebe mašine. Dok mašina sačinjava potpunu tehničku shemu, kao odnos prirode i ljudskog bića, kao susretanje informacije i energije koji operišu na materijalu, nijedan od četiri momenta učešća informacije nije organski povezan i balansiran sa ostalima. Čin učešća informacije postaje razdvojen, on eksplodira na izdvojene momente preuzete od strane odvojenih individua ili grupa. Kako bi zanatlija prepoznao svoj ekvivalent u industrijskom modalitetu, isto ljudsko biće mora biti pronalazač, konstruktor i rukovalac. Kako bilo, efekat te amplifikacije i komplikacije industrijskog sveta jeste u tome da on razdvaja različite uloge jedne od drugih: ne samo izvor informacija od izvora energije i izvora primarnog materijala, već čak i različite zadatke učešća informacije. To je prema tome slabiji deo totalnih kapaciteta ljudskog bića koji je uključen u industrijski čin, jednako kada je on/ona rukovalac kao i u drugim načinima doprinosa informacija. Iterativan i fragmentarni režim rukovaoca u industrijskoj proizvodnji je „anatomija rada“,[8] to izaziva različite efekte industrijskog zamora. Ali je takođe iscrpljujuće imati samo pronalazak kao zadatak, bez učestvovanja u konstruisanju i rukovanju. Figura nesrećnog pronalazača pojavila se u isto vreme kada i figura dehumanizovanog radnika: to je protiv tip i on se pojavljuje iz istog razloga. Da postavi sebe u dimenziju ulaza za energiju mašine, ulaz za informacije komplikuje samog sebe, postaje

podeljen i specijalizovan, sa rezultatom da ljudsko biće nije samo izolovano od prirode[9] već takođe od samog sebe, i ograđeno rasparčanim zadacima, čak kao pronalazač. On prema tome susreće diskontinuiranost tokom rada.

Kako bilo, pokušaj da se vratimo direktno zanatskim načinima proizvodnje je iluzija. Potrebe savremenih društava zahtevaju ne samo velike kvantitete proizvoda i manufakturisanih objekata, već takođe stanja koja ne mogu biti postignuta uslovima koje pruža ljudsko telo i alat. To je zbog toga što temperature, pritisci, potrebne fizičke reakcije, razmere tih uslova se ne poklapaju sa onim u ljudskom životu. Radno mesto, s druge strane, jeste *ljudska okolina.*

U samom ovom insistiranju na industrijskoj proizvodnji, u produbljivanju njezinih karakteristika pojavljuje se kao moguće da se jedno prevazilaženje antiteze između zanatskog i industrijskog modaliteta može proučavati sa većom verovatnoćom uspeha. I to ne samo generalno i površno već pomoću onoga što, unutar industrijske organizacije proizvodnje, biva gurano do svojih ekstremnih granica specijalizovane fragmentacije ljudskih informacionih doprinosa: racionalizacija rada kroz seriju metoda u kojima je tejlorizam bio prvi.

### III  Voljne akcije: Studija normi

Ali ovde moramo skratiti razmatranja afektivnih modaliteta kako bismo istražili norme voljne delatnosti, i tako upotpunili ovu konstrukciju tehničkog mentaliteta. Naravno, tehnički mentalitet može biti razvijen u sheme delanja i u vrednosti, do tačke donošenja merila u ljudskim okruženjima koja su potpuno posvećena industrijskoj proizvodnji. Ali dokle god ta okruženja ostaju odvojena od društvenog polja upotrebe proizvoda rada, dokle god one same ostaju fragmentirane u nekoliko specijalozovanih grupa svojim različitim funkcijama informacionog doprino-

sa mašinama—upravljači, tehničari, radnici--, ona ne mogu elaborirati vrednosni kod koji je sposoban da postane univerzalan, jer nemaju iskustvo tehničkih realiteta kao celine. Tehnokratski stav ne može biti univerzalizovan zato što se on sastoji od ponovnog pronalaženja sveta kao neutralnog polja za prodor mašina; konstruisanje metalnog tornja ili ogromnog mosta nesumnjivo znači stvaranje pionirskog rada i pokazivanje kako industrijska moć može napustiti fabriku kako bi zadobila prirodu, ali postoji nešto od izolacije pronalazača što opstaje u ovoj aktivnosti dokle god kao kula ili most ne postane deo mreže koja prekriva zemlju svojim lavirintima, u skladu sa geografskim strukturama i mogućnostima života na ovoj Zemlji. Ajfelov toranj i Garabitov viadukt moraju biti shvaćeni kao pristizanje kraja industrijske koncentracije oko izvora energije ili primarnih izvora materijala, što će reći ne kao spektakularni izolovani centri i uspesi, već kao prvi lavirint virtualne mreže. Ajfelov toranj, koji je potpuno dizajniran i proizveden u fabrici, i jedino je sastavljen na mestu podizanja, bez ijedne ispravke, nije postao nosač antene; on se povezuje sa stotinama stubova, jarbola, i stanica kojima će Evropa biti pokrivena. On postaje deo multifunkcionalne mreže koja markira ključne tačne geografskog i ljudskog sveta.[10]

Ono što dozvoljava stvaranje tih mreža je standardizacija subsetova, industrijska mogućnost proizvodnje odvojenih delova koji su svi slični jedan drugom. Kada se postavljaju šine preko stotina kilometara, kada se razvija kabel od grada do grada i ponekad od kontinenta do kontinenta, to je industrijski modalitet koji uzima odsustvo od industrijskog centra kako bi proširio samog sebe kroz prirodu. Ovo nije pitanje silovanja prirode ili pobede ljudskog bića nad elementima, zbog toga što ovde ustvari same prirodne strukture služe kao tačka na koju se kači mreža koja se razvija: na primer, relejne tačke Hercijanskih „kablova" pridružene sa visokim mestima

antičke sakralnosti iznad dolina i mora.

Ovde, tehnički mentalitet uspešno upotpunjuje samog sebe i ponovo se pridružuje prirodi okrećući se ka mreži misli, u materijalnoj i konceptualnoj sintezi posebnosti i koncentracije, individualnosti i kolektiviteta—jer celokupna sila mreže dostupna je u svakoj od njenih tačaka, i njeni lavirinti su utkani zajedno sa onima sveta, u konkretnom i posebnom.

Slučaj informacionih mreža je takoreći jedan idealni slučaj gde je uspeh praktično potpun, zato što su ovde energija i informacije ujedinjeni ponovo pošto su bili razdvojeni u industrijskoj fazi. U isto vreme, sklopovi i podstrukture industrijskog gigantizma vraćaju se na mnogo izvodljiviji način, u lakšoj formi: eletronika i telekomunikacije koriste redukovane tonaže, umerene energije, dimenzije koje nisu slamajuće. Fabrika ponovo otkriva nešto od radnog mesta kada je transformisana u laboratoriju. Ona nije više tu za pojedinačnog korisnika, kao u zanatskom modalitetu, već simultano za kolektivnog i individualnog korisnika – samu prirodu – [11] tako da laboratorija anticipira po-meri-napravljenu montažu. Takve linije stubova, kao što je lanac releja konstituišu slojeve prirode. Samo proizvodnja odvojenih delova ostaje industrijska. U isto vreme, distanca između pronalazača, konstruktora, i rukovaoca je redukovana: tri tipa konvergiraju ka slici tehničara koji je ovog puta jednako inteligentan i vešt, i koji u isto vreme zna kako da izračuna i kako da instalira kabliranje. Vrlo blizak sa slučajem informacionih mreža jeste slučaj mreža distribucije energije: električna energija u isto vreme je i informacija i energija: s druge strane, ona može biti beskonačno kroćena bez smanjenja produktivnosti. Vibrator, koji je motor, može biti smešten na vrhu alata lakog kao olovka i snabdevan na mreži. Ljudsko biće može lako jednom rukom manipulisati 1/3 konjske snage motora. A energija može biti potpuno modulirana, u samom trenutku upotrebe, kroz informaciju čiji ona postaje verni nosač. S druge strane, sama standardizacija uslova proizvodnje energije, što dozvoljava međupovezanost i normalizovanu distribuciju, pretvara tu energiju u nosača informacija: može se postaviti alternativna mreža kako bi učinila da funkcioniše (kao izvor energije) sat čiji rad ona reguliše kao nosač informacije. Istovremena upotreba je koncentrisana u sinhronički motor.

*Komunikacione i transportne mreže* su, nasuprot tome, manje čiste. One ne uspevaju da otkriju same sebe u njihovoj istinskoj funkciji, i tehnički mentalitet ne uspeva da sasluša sebe na bilo koji nadmoćan način, pre svega zbog toga što društvena ili psihološka ometanja stavljaju značajno breme [na te mreže]; drugo, zato što za razliku od informacionih ili energetskih mreža, one nisu potpuno nove i bez funkcionalnih prethodnika. Pruga je uživala privilegovanu poziciju zato što je bila relativno jasno odvojena od puta, što je značilo da se ona može razvijati na jedan gotovo autonoman način. U slučaju tih drugih mreža, svejedno, društveno počinje da se manifestuje u formi *zastarelosti*, vrsti neupotrebe koja je povezana sa starenjem konvencija i transformacijom društvenih navika pre nego istrošenošću ili gubljenjem funkcionalnosti tehničkog objekta. Robni karavan ili vagon sa ugljem iza lokomotive, stare sporije nego putnička kola, sa svojim ornamentima i natpisima: najpreopterećenija nesuštinskim ornamentima su ona koja izlaze iz mode najbrže.

Ali u tehničkim objektima predviđenim za mrežu puteva otpor spram razvoja tehničkog mentaliteta je najjasniji: zastarelost pogađa putnička kola mnogo brže nego komunalna vozila ili poljoprivredni traktor, koji su svejedno njegovi bliski rođaci – kola brže stare nego avion, a avion je prošao tehnički kroz mnogo važnije transformacije nego kola. To je zbog toga što je avion napravljen za pistu i vazduh. On je neophodno *mrežna realnost* pre nego što post-

ane odvojeni objekat.[12] Kola nisu jedino zamišljena kao *mrežna realnost*-kao što su to kamioni-već kao društveni objekat, kao jedan komad odeće u kome se korisnik pokazuje. Ona prema tome dobijaju karakteristike poput onoga što se nosi na odeći i što je preopterećuje sa čipkama i ukrasima...ti ornamenti poput kore psihološkog života - ovde postaju boja, hrom, antene. Društvena važnost može se takođe izraziti kroz masu, zapreminu, i veličinu vozila.

Kako bi proizvodnja tehničkog mentaliteta bila svedena na područje voljnog izbora, moglo bi se pokušati sa primenom kategorija zajedničke etike odnosa između ljudskih bića, na primer kategorije iskrenosti: kola se raspadaju brzo zbog toga što su napravljena da budu viđena, pre nego da budu korištena; prostor zauzet širinom vrata nije zaštićen od rđe; unutrašnja strana nije sređena prema principima aerodinamika, a vidljivi delovu su obilno profilisani.

Ali suština nije ovde, i uvođenje dualističkog moralnog sistema dobra i zla, skrivenog i pokazanog, neće nas odvesti daleko. Kako bismo našli stvarne norme ovog područja, moramo se vratiti već skiciranim saznajnim shemama, i pitati se kako one mogu odgovoriti hitnosti manifestovanoj najaktuelnijim nekoherentnostima afektivnih modaliteta.

Razlog za nesuštinski karakter tehničkih objekata, koji je u isto vreme uzrok ove inflacije zastarelosti koja je pogodila populaciju proizvedenih objekata, jeste odsustvo jednog industijskog produbljivanja proizvodnje.

Kola postaju prevaziđena veoma brzo zbog toga što nemamo jedan i isti čin otkrića, konstrukcije, i proizvodnje koji istovremeno čini da se pojavi mreža puteva i kola. Između mreže—ovog funkcionalnog pojasa geografskog sveta—i kola koja prelaze tu mrežu, ljudska bića ubacuju sebe kao stvarnog kupca: kola jedino ulaze u funkciju kada su kupljena, ukoliko su odabrana, pošto su proizvedena.

Ovde postoji ponavljanje koje ulazi u igru na bazi te medijacije: konstruktor, koji treba proizvoditi serijski, treba da izračuna verovatnoću prodaje; on ne sme prosto istovremeno konstruisati mreže i kola, već takođe mora anticipirati opcije prodaje. Kako bi bila vredna, kola moraju biti kupljena pošto su bila konstruisana, kao rimsko dete koje je doneseno na svet od strane majke ali mu je bilo dozvoljeno da živi tek posle elevatio. Možemo takođe uporediti ovo otuđeno stanje proizvedenog objekta u situaciji podmitljivosti sa situacijom roba na tržištu u antici, ili pozicijom žene u situaciji društvene inferiornosti: uvođenje u aktivno postojanje dešava se kroz uslove koji su neadekvatni realnim funkcijama. Ono zauzima mesto protiv entelehije i prema tome kreira dualitet, preovladavanje nesuštinskog, distorziju istinske prirode: izbor je pravi pod dubioznim uticajem šarma, prestiža, laskavosti, svih društvenih mitova ili ličnih verovanja. U nesuštinskoj situaciji kupca-koji nije ni konstruktor niti korisnik u činu-ljudsko biće koje bira, uvodi u svoj izbor snop netehničkih normi. To je anticipacija, u projektu proizvodnje, igre tih normi koja stvara pomešani karakter podmitljivosti industrijskog proizvoda, i to je glavni izvor zastarelosti. *Distanca* između čina proizvodnje i čina potrebe, taj nedostatak stvarne informacije dopušta uvođenje nesuštinskog, koje kreira zastarelost. Zato što je suđen jednom za navek, prihvaćen ili odbijen u potpunosti odlukom ili odbijanjem da se kupi, objekat industrijske proizvodnje je zatvoreni objekat, lažni organizam koji je zaposednut holističkom mišlju koja je bila psihosocijalno proizvedena: to ne dozvoljava niti ispoljavanje niti razvoj tehničkog mentaliteta na nivou voljnih odluka i delatnih normi. Ali kako je moguće doći do strukture objekta koja bi nam dozvolila da skiciramo tehnički mentalitet? Pre svega, i uopšteno govoreći, pozicija asketizma dozvoljava nam da se oslobodimo artificijelnog i nezdravog karaktera društvenih bremena, koja

izražavaju sebe kroz hipertalične razvitke ili razvitke koji u realnosti ne funkcionišu. Savremeni transatlantski kruzer—lažni plutajući grad pre nego instrument trasporta—polako teži ka regrutovanju usamljenih i dokonih; tovarni brod je mnogo čistiji. Ova proliferacija nesuštinskog već se pojavljuje kod komercijalnog aviona: kompanije se ulaguju putniku; avioni postaju veći i teži. Ali suštinsko leži u ovome: kako bi jedan objekat dozvolio razviće tehničkog mentaliteta i bio odabran od njega, sam objekat mora biti retikularne strukture. Ako zamislim objekat koji, umesto da bude zatvoren,  nudi delove koji su smišljeni tako da budu toliko blizu neuništivosti koliko je moguće, i druge, nasuprot, u kojima bi bio koncentrisan veoma veliki kapacitet da se prilagode svakoj upotrebi, ili habanju, mogućem lomu u slučaju šoka,  ili lošeg funkcionisanja, onda možemo zadobiti jedan *otvoreni* objekat koji može biti dovršen, unapređen, održavan u stanju perpetualne aktualnosti. Električna mašina koja nije obezbeđena sa jednim organom zaštite, bilo kakvim osiguračem, samo je u pojavi jednostavnija od zaštićene mašine. Kada se dogodi preopterećenje, sistem za zaštitu pripomaže, i mašina postaje apsolutno uporediva sa onim što je bila pre nesreće, kada sistem zaštite bude vraćen u njegovo početno stanje. To vraćanje u početno stanje pretpostavlja standardizaciju, normalizaciju; što je rigoroznija ta normalizacija, to je savršenija mašina: to je slučaj sa kalibrisanim osiguračima, ili takođe sa elektronskim cevima koje se mogu zameniti u mašini. Ovo je ključna tačka: Postindustrijski tehnički objekt jeste jedinstvo dva sloja realnosti; sloja koji je stabilan i permanentan koliko je moguće, koji pristaje korisniku i koji je napravljen tako da traje, i sloja koji može biti konstantno zamenjivan, menjan, obnavljan, zato što je sačinjen od elemenata koji su sve manji, nepersonalni, masovno industrijski proizvedeni i distribuirani svim mrežama razmene. Kroz učešće u toj mreži događa se da tehnički objekat uvek ostaje savremen svojoj upotrebi, uvek nov. Međutim, ovakva konzervacija u stanju pune aktualnosti precizno je učinjena mogućom kroz strukture koje saznajne sheme obezbeđuju: potrebno je da objekat ima *pragove funkcionisanja* koji su poznati, izmereni, normalizovani, kako bi bio sposoban da bude podeljen u permanentne delove i delove koji su s namerom napravljeni da budu fragilni, i podložni zameni. Objekat nije samo struktura već i režim. I normalizacija pragova funkcionisanja izražava sebe u razlici između relativno separatnih subsetova [celine]: nivo solidarnosti je precizna mera (u Grčkom smislu „metriona") relacije između permanentnih delova i delova koji su podložni zameni: ta mera je ono što definiše optimum režima u relaciji sa pragovima funkcionisanja.

U zaključku, možemo reći da se tehnički mentalitet razvija, ali da ova formacija ima odnos kauzalnosti koji se ponavlja sa samom pojavom post-industrijskih tehničkih realiteta: ona čini eksplicitnom prirodu tih realiteta i teži ka tome da ih opskrbi normama kako bi osigurala njihov razvitak. Takav mentaltet može se razviti samo ako afektivna anatomija suprotstavljenosti zanatskog i industrijskog modaliteta može biti zamenjena postojanom orijentacijom svojevoljnog pregnuća ka razvitku tehničkih mreža, koje su postindustrijske i prema tome ponovo uspostavljaju kontinuirani nivo [operacije].

Ukoliko tražimo znak savršenosti tehničkog mentaliteta, možemo ujediniti pod jedinstvenim kriterijumom manifestacije kognitivnih shema, afektivne modalitete, i delatne norme: kriterijumom *otvaranja;* tehnička realnost smešta sebe izvanredno dobro tamo odakle može biti nastavljena, dovršena, usavršena, proširena. U tom smislu, jedno proširenje tehničkog mentaliteta je moguće, i počinje da se manifestuje posebno u oblasti finih umetnosti. Konstruisati građevinu prema normama tehničkog

mentaliteta znači smisliti je tako da ona može biti uvećana, nastavljena, proširena bez disfiguracije ili trošenja. „Le Korbusije manastir" je lep primer doprinosa tehničkog mentaliteta u arhitekturi: on uključuje unutar svog plana pravu liniju proširenja, za dalje uvećanje. I to nije moguće samo zbog arhitekturalne koncepcije celine, već takođe i zbog duha uparivanja koji se manifestuje u izboru formi i upotrebi materijala; bilo bi moguće, bez ikakvog prekida između starog i novog, i dalje koristiti beton, kapke, gvožđe, kablove, i tabulaturu dugih koridora. Neprikrivanje svrha, ta učtivost arhitekture spram materijala koja prevodi sebe kroz konstantnu tehnofaniju, teži ka odbacivanju zastarelosti i ka produktivnom otkriću razumne vrste permanentne dostupnosti industrijskog materijala kao temelja kontinuiteta rada.

1. [Ovaj Simondonov neobjavljeni tekst dao nam je njegov sin Mišel, u sećanje na koga je ovo izdanje posvećeno- J.H. Bartelemi i Vinsent Bontems, *Parehesija prim. prev. Arne de Bouver* takođe puno zahvaljuje Nataliji Simondon na njenoj dozvoli da objavimo ovaj tekst.]

2. Koji je bio bogat shemama plastičnosti i faznim promena, reverzibilnim ili ireverzibilnim. One bez sumnje dolaze od zanatskih tehnika pripremanja, oblikovanja i pečenja gline. Ove sheme ontogeneze, dolazeći od jedne operacije potpuno izvedene od strane ljudskog bića, kontinuirane, progresivne i koja se uklapa sa skalom ljudskih bića, susreće se sa drugim shemama, takođe ontogenetskim, ali koje uključuju susretanje suprotstavljenih i kvalitativno antagonističkih principa koji su prostorno i geografski razdvojeni, i dimenzije koja ih čini *transcendentnim* u odnosu na ljudsko biće: zemlja i nebesa, toplo i hladno, suvo i vlažno. Da bi se te dve realnosti susrele, one moraju biti iste razmere. Prirodna filozofija antike dolazi iz susretanja zanatskih i magičnih shema geneze, od shema kontinuiteta i shema diskontinuiteta. Poljoprivreda i odgajanje su svakako industrije i umešnosti, kada ljudska bića ne drže uslove u svojim rukama.

3. [Francuski tekst je sačinjen na isti način, sa rečenicama koje se sastoje od relativnih predloga koji dodaju primer za prethodnu rečenicu- J.H. Bartelemi (J.-H. Barthélémy))]

4. [Ovaj kontradiktorni izraz je Simondon koristio kako bi referisao na *prevladavanje klasičnih suprotnosti* (čemu je njegova čitava misao težila). "Teorija znanja" o kojoj Simondon ovde govori je teorija čiji je zadatak da proširi-prevaziđe Kantov "Kopernikanski obrt" –koji je već bio orijentisan ka prevladavanju klasičnih suprotnosti-onim što sam ja nazvao, u mom sopstvenom radu, "Ajnštajnovski obrt" ili filozofska relativnost. Čitav ovaj Simondonov paragraf je od fundamentalnog značaja ovde, i njegova povezanost sa prethodnim paragrafom, koji je diskutovao kibernetiku, proširuje argument njegovog teksta "Allagmatics." U tom tekstu, Simondon je prikazao kibernetiku kao "Teoriju operacija" koja teži ka tome da "bude univerzalna kibernetika" *( L'individuation à la lumière des notions de forme et d'information [Individuation in light of the notions of form and information]. Paris: J. Millon, 2005, 561 )*. Moramo prema tome biti obazrivi i ne redukovati Simondonovu misao na kibernetiku, jer univerzalnost na koju se cilja u "Allagmatics" donosi duplu kritiku kibernetske sheme povratne sprege i klasične koncepcije informacije. Konačno, treba primetiti da  tekst "Allagmatics" takođe insistira na onome što kraj paragrafa o kome se diskutuje ovde govori preciznije: teorija operacija je relativno nezavisna od ontološkog područja bića- J.H. Barthelemi)]

5. Kada su boinzi počeli eksplodirati u letu, bila je velika greška osuditi ih kao "loše  avione"; precizniji pristup sastojao bi se u proučavanju ponašanja ćelija izloženih vibracijama i ograničenjima unutrašnjeg suzbijanja, kako bi se odredile zone "Zamora" metala. Pravnik, De Grif, govori u *Notre destinée et nos instincts* [Našoj sudbini i našim instinktima] da kriminalac nikad ne bi bio osuđen ako bi mu bilo suđeno u njegovim "jaslicama"; to je nesumnjivo zbog toga što počevši od ove inicijalne faze njegovog života, smatrali bismo ga konstruisanim, kao sačinjenim od različitih omotača u relativnoj solidarnosti jednog sa drugim. Osuda generalno žrtvuje nešto smatrajući individu kao homogenu celinu. To je način na koji rasizam i ksenofobija bivaju proizvedeni.

6. [O ovom poznatom "procesu konkretizacije," vidi prvo poglavlje Simondonovog klasičnog dela: *Du mode d'existence des objets techniques.* [O načinu egzistencije tehničkih objekata] Paris: Aubier, 1958 (sa nekoliko novih izdanja od tada). Simondon će se u ovom tekstu vratiti poznatom primeru "Guimbalove turbine".- J.H. Bartelemi.]

7. U određenom smislu, poljoprivreda, odgajanje, navigacija pri plovidbi, su više industrijski nego zanatski, do tog nivoa da oni imaju veze sa snagama *koje ne zavise od ljudskog bića,* i to dolazi od realnosti čiju skalu nadilazi skala onoga što može biti manipulisano. Te operacije uvode *diskontinuirano* u istoj meri; one su, eventualno, otuđivačke, i mogu izazvati uspon *magično-religijskih praksi mišljenja.* Naravno, *one komoduliraju ljudsko upravljanje pripremanjem i kosmološkim činjenjem.* Ljudski rad ostaje bez rezultata, pošto su semena posejana ili pošto su brodovi konstruisani, ako kosmički čin (kiša, vetar, poplava) nije usledio kako bi primio i uvećao ljudski napor. Ljudski napor mora biti u skladu sa kosmičkim činom, i biti "en Kairo." U odgajanju ovce, prosperitet stada ne zavisi samo od rasta biljaka i režima padavina, već takođe i od epizoota.

8. [Ovo je citat naslova dela Džordža Fridmana (Georges Friedmann:): *Le travail en miettes* [doslovno, "rad u delovima"; translated into English by Wyatt Rawson as *Anatomy of Work: Labor, Leisure, and the Implications of Automation.* New York: Free Press of Glencoe, 1962—Trans.]. In *Du mode d'existence des objets techniques* [O načinu egzistencije tehničkih objekata], in 1958. Simondon je proširio i produbio Fridmanovu refleksiju "fizičke i mentalne" otuđenosti radnika u svetu mašina-kapitalističkom kao i komunističkom. Simondonov genij bio je u tome što je pokazao da rešenje nije u osudi mašina, već u prepoznavanju njihovog statusa "tehničkih individua" koje moraju "nositi alate" i prema tome osloboditi ljudska bića od njihovog statusa jednostavnog asistenta. Naravno, problem nezaposlenosti koji će biti raspaljen ovim simultanim oslobođenjem ljudskih bića i mašina znači da bi takav progres u stvari jedino bio moguć unutar drugačijeg ekonomskog sistema, u kome ekološki rizici, trenutne ekonomske krize, i takođe uskoro tehnička unapređenja - na primer, zamena ljudskih bića koja rade u supermarketima na kasi sa mašinama-bi nas *prisilno* vodila.-J.H. Bartelemi.]

9. Industrija izoluje ljudskog biće iz prirode jer ona uzima kontrolu nad odnosom ljudsog bića i prirode: ona *je,* naravno, kroz odnos prema ljudskom biću, koji zamenjuje realnost kosmičkog poretka (vetar, kiša, poplave, epizooti) dok umanjuje do određene mere njenu nezavisnost u odnosu na odnos spram ljudskog bića, već konzervira transcendenciju dimenzije i karakter diskontinuiteta, ili ireverzibiliteta.

10. [Pojam "ključnih tačaka" pojavio se u trećem i poslednjem delu *Du mode d'existence des objets techniques* (O načinu egzistencije tehničkih objekata), koji se bavio teorijom "fraza kulture". Ključne tačke ovde karakterišu "primitivno magijsko jedinstvo" kao prvi način bivanja ljudskog bića- dakle pre bilo kog "menjanja faze" ovog primitivnog jedinstva *u tehničku i religijsku fazu.* Ako u ovom tekstu Simondon koristi pojam "ključnih tačaka" ponovo, on to ovog puta čini u smislu tehničkog sveta kao takvog, to je zbog toga što sa dvadesetim stolećem, se pojavljuje *novo jedinstvo* koje će biti jedinstvo "multifunkcionalne mreže" kao jedinstvo ljudskog bića, prirode, i tehnologije. To je takođe ono čemu nas ostatak teksta vodi, i moramo biti pažljivi spram fakta da Simondonovo vrednovanje "informacionih mreža" zaista datira od 1968, čak od 1958: Simondon je u tom smislu bio istinski vizionar. J.H. Bartelemi.]

11. [Može se  činiti čudnim što Simondon razmatra i samu prirodu kao korisnika tehnika. Ostatak paragrafa objašnjava šta on podrazumeva pod time: "linija stubova" ili "relejni lanac" su "sprege prirode".  Mogli bismo prigovoriti da korišćenje tehnika ostaje *ljudsko* ovde, i da je priroda ovde samo ograničenje koje postavlja ono što Simondon naziva "sprava-za-merenje sklopova". Poslednje će onda biti pogrešna zajednička tačka sa radnikom-jer u poslednjem slučaju, "napravljeno-po-meri" referiše na *korisnika.* To je ono zbog čega pravi razlog Simondonove pretpostavke leži drugde, naime u proširenju – koje je odsutno u ovom slučaju, ali prisutno u drugim tekstovima – o onome što je bilo rečeno *u isto vreme* o "mreži misli" kao jedinstvu ljudskog bića i jedinstva prirode i o "laboratoriji". To proširenje sastoji se u sledećoj ideji: u tehničkoj celini koje *naučna i informacionalizovana* laboratorija predstavlja, tehnička realnost nedvojbeno konkretizuje sebe, tehničku realnost čija efektivnost teži, kroz  instrument znanja kao *tehničkog odnosa ljudskog bića spram prirode,* da omogući *prirodu koja je u ljudskom biću* da tranformiše sebe u "transindividualnost" koja je neodvojivo ljudska i tehnogeografska. Za pojam "transindividualnog" i njegovu vezu sa tehničkom "konkretizacijom", vidi *Du mode d'existence des objets techniques* [O načinu egzistencije tehničkih objekata], 247-249, kao i poslednje poglavlje *L'individuation psychique et collective* (dolazi kao Psychic and *Collective Individuation* with the U of Minnesota P).—J.-H. Bartelemi.]

12. [Ovaj status aviona može biti uporeden sa onim što Hajdeger (Martin Heidegge) govori o komercijalnom avionu u njegovom poznatom seminaru „Pitanje o tehnologiji", ja sam diskutovao ovo poređenje-koje je takođe jedna interna kritika Hajdegerove misli - u mom radu "La question de la non-anthropologie" ["Pitanje ne-antropologije"] (in Vaysse, J.M. ed. *Technique, monde, individuation. Heidegger, Simondon, Deleuze.* [Tehnologija, Svet, Individuacija. Hajdeger, Simondon, Delez.] Hildesheim: Olms, 2006. 117-132).—J.-H. Bartelemi.]

# Hiljadu ekologija:
# proces kibernetizacije i opšta ekologija

**Ekološki enciklopedizam**

*„L'écologie, tâche de la pensée/ekologija, zadatak mišljenja"* [1], kaže Mišel de Gi (Michel Deguy). Bolje rečeno, to je zadatak *našeg* mišljenja: zadatak da mislimo današnjicu i ono što dolazi, sledeći zadatak našeg mišljenja. Ali pitanje onda ostaje otvoreno: kakav je taj budući zadatak uopšte? Šta su mu obrisi? Šta su mu ulozi? Odakle se ispisivalo naše *postajanje-ekološkim*? I kako bi trebalo opisati nastanak opšte ekologije naspram ograničene ekologije, koja se odvija pred nama? Degijev izraz "zadatak mišljenja", upotrebljen ovde da bi se naglasila hitnost i obim ekološkog pitanja, izvorno je upotrebio Hajdeger da bi sažeo kraj filozofije i obrt mišljenja kojeg je prouzrokovalo tehnološko ispunjavanje metafizike kao kibernetike. Izbor tog izraza je vrlo značajan, pošto se kroz njega, barem između redova, oslikava veza sa procesom kibernetizacije kao tehnološkog uslova opšte ekologije mišljenja koju

Degi naglašava. Takođe, ovo u neku ruku ide protiv Hajdegerove vlastite upotrebe tog izraza, i kao takvo, ono izražava ono tehnološko nesvesno našeg doba: Hajdegerova primedba iz sredine šezdesetih se možda u međuvremenu pokazala izuzetno tačnom: utoliko što je vrlo rano prepoznala ogroman obim kibernetskog izazova dogmatske predstave mišljenja, i utoliko što je time predvidela zamenu tradicionalnih kategorija i vodećih razlika (Leitdifferenzen) pojmovima komande i kontrole; ipak, njegov vlastiti opis onoga što je nazvao "budućim zadatkom mišljenja" ostao je u krajnjem začuđujuće maglovit i ponekad čak podređen protiv-tehnološkim poetikama.[2] Taj nedostatak jasnoće u odnosu na širi noo-politički horizont kibernetskog doba možda je isprva nastao zahvaljujući Hajdegerovom (Martin Heidegger) u suštini nedovoljnom poimanju istorije i istoričnosti predmeta, u kojima je preovladavala pretežno instrumentalna predstava tehnologije. Hajdeger nije u potpunosti istražio stvarnu misao

postajanja tehnološkim, koja bi uključivala i postajanje same tehnologije, i koja se razvija iz fundamentalne transformacije smisla tehnologije kao takve, izvan njenih tradicionalnih derivacija u vidu oruđa-pribora/instrumentalnog i mehaničkog.[3] Štaviše, iako je sam neprestano problematizovao i napadao antropološki, odnosno humanistički poredak, njegovo vlastito mišljenje je još uvek bilo previše antropocentrično da bi moglo da opiše budućnost kibernetskih i neo-kibernetskih spojeva ljudi, živih bića i tehnologija – drugim rečima, ljudskih i ne-ljudskih sila – i da bi iz njih povuklo nužne pojmovno-političke posledice. Niti je to mišljenje moglo pod tehnološkim uslovima da opiše fundamentalno nova iskustva i stanovišta, od kojih je svako ne samo de-subjektivizovano i de-objektivizovano, nego je, kao što ćemo uskoro detaljnije videti, takođe određeno pojmom okoline u radikalno tehnološkom obliku. Zbog njihovog suštinskog okolinjaštva[4] teško ih je obuhvatiti Hajdegerovim pojmovnim arsenalom.[5]

Opis koji je moguć danas, pola veka nakon Hajdegera, opis zadatka mišljenja kao ekološkog, ima čvrsta dijagnostička i pojmovno-politička uporišta upravo u evoluciji tehnološke objektivnosti koja se primećuje od tada: smisao ekološkog kao takvog – što određuje ujedno zadatak mišljenja i horizont kibernetskog doba – pojašnjava i razvija se pre svega na predmetno-istorijskoj ravni. Nasuprot svim ekološkim predubeđenjima koja ekologiju vezuju za prirodu, ona sama sve više predstavlja ne- ili iz-vanprirodne obrasce koji su se uspostavili pre više od pola veka kroz obimnu kibernetizaciju i kompjuterizaciju života.[6] Radikalno tehnološko posredovanje koje se implementiralo od 1950. kroz proces kibernetizacije – i koji se danas odvija unutar čulnih i misaonih sredina što postoje u mikro-temporalnim oblastima, u prodornim medijima i sveprisutnom računanju – omogućava problemu posredovanja kao takvom da se izrazi u potpunosti, otkrivajući ga

uz takvu radikalnost kao nikada pre. Kao takav, to je ujedno problem i pitanje konstitutivne relacionalnosti; ili, preciznije – parafrazirajući Žilbera Simondona (Gilber Simondon) – problem izvornog odnosa između individue i njenog miljea, sa kojim je ona uvek već spojena, i koji ne bi predstavljao samo nekakvo gotovo, prethodno „prirodno" okruženje kojem bi se ona morala prilagoditi, već se mora pre shvatiti kao mesto njene izvorne i neizbežne veštačkosti, sa kojom je sjedinjen, i sa kojom se zajedno pojavljuje; ko-evoluciju, ili da upotrebim izraz Žan-Lik Nansija (Jean-Luc Nancy), *komparutacija* (comparution).[7] Može se isprva pretpostaviti kako ekologija izražava ujedno sadašnjost i budućnost u istoriji smisla u kojem se nameće upravo to pitanje izvornosti tog odnosa. Odnos se mora shvatiti kao nešto što prethodi oblikovanju pojmova odnosa (subjekt, objekt, individua, grupa, zapravo svih oblika kolektivnog ljudskih i ne-ljudskih činioca): prevashodno, on mora proći kroz sve moduse i nivoe Bića, od mikro do makro, što će reći da je on „modus bića"[8] Iskaz „Biće je odnos"[9] – koji Didije Debaiz (Didier Debaise) ispravno shvata kao ključan iskaz savremene misli kao i izraz našeg trenutnog ontološkog stanja – sažima osnovno načelo opšte ekologije. Drugim rečima: u insistiranju i zaraznosti pitanja relacionalnosti, otkriva se srž naše eko-tehničkosti.

Na tragu Simondonove fundamentalne razlike između tri oblika ili stupnja enciklopedijskog duha, ekološki zadatak mišljenja se može posmatrati kao celina koja temelji ono što predlažem da se nazove četvrtim tipom enciklopedizma. To je upravo ulog opšte ekologije, tehnologije i medija. Simondon, koji je sam mapirao složenu ekologiju participacije zasnovanu na dijadi individua-milje i na pojmu pred-individualnog, i koji se stoga može smatrati jednim od pionira opšte ekologije,[10] pravi razliku između etičkog enciklopedizma renesanse,

tehničkog enciklopedizma Velike Enciklopedije i prosvetiteljstva, i napokon tehnološkog enciklopedizma kibernetskog doba. Svaka vrsta enciklopedizma je, načelno, izraz osnovne želje društva da „dostigne zrelo i slobodno stanje, pošto režim i konvencije misli podilaze individuama i održavaju ih u veštačkom stanju nezrelosti."[11] Otuda je jasno da je prema Simondonu sila naučnog, u krajnjem tehničkog mišljenja i izuma, ta koja oslobađa i univerzalizuje, time omogućavajući ono što on naziva transindividuacijom. Transindividuaciju ona postiže lomljenjem zatvorenih društvenih sistema koji kontrolišu procese psihičko-kolektivne individuacije – barem na trenutak, pre nego što se ovi (re-)dogmatizuju.[12] Evolucija tehničkih predmeta se naročito pokazala kao vodeća sila prosvećivanja. Ono što je bitno jeste da su svi enciklopedizmi kao takvi uvek spojeni sa istorijom tehničkih predmeta. Taj spoj je ključan, te obuhvata čak i nastanak takozvanih otvorenih objekata, otvorenih mašina i tehničkih sastava, koje bi trebalo smatrati vesnicima novog, kibernetskog prosvetiteljstva koje se, prema Simondonu, na kraju dogodilo sredinom dvadesetog veka: „Kibernetika čoveku pruža novu vrstu većine."[13] Na taj način, Simondon je 1958. opisao treći, tehnološki enciklopedizam. Zbog operacionalizacije svrhovitosti kao takve, što joj je verovatno suštinski poduhvat, kibernetika je prekinula dugotrajan režim svrhovitosti i podređenosti uvek već datim svrhama. Kako piše Simondon: „Čovek prevazilazi ropstvo svesnim organizovanjem svrhovitosti."[14] Pošto je dokrajčila režim „sredstava i svrha", univerzalna kibernetika (Simondon – koji je sam oštro kritikovao prvorazrednu kibernetiku njegovog vremena i njenu opčinjenost automatizmom i njenu fiksaciju adaptacijom – govori o „alagmatičnoj" ili transverzalnoj, objedinjujućoj teoriji operacija) otkriva posredovanje *kao takvo* prvi put u istoriji, otvoreno postavljajući pitanje i problem posredovanja i postavljajući njegovu organizaciju

na mesto ključnog problema našeg doba. Ovo je, u najmanju ruku, cilj kibernetskog prosvetiteljstva: prema Simondonu, ono „prosvećuje otvorene procese društvenog i individualnog života. U tom smislu tehnologija smanjuje otuđenost."[15] Posredovanje kao takvo sada postaje ključni problem enciklopedizma našeg doba.

Nakon ovih opaski o otuđenju i prosvetiteljskom duhu kibernetike, ne samo da smo prodrli sve dublje u organizaciju i operacionalizaciju posredovanja, ne samo da smo načeli obećanu otvorenost psiho-socijalnih procesa i otvaranje posredovanja; nego je istovremeno i sveobuhvatna kibernetizacija i kompjuterizacija našeg oblika života donela sa sobom i nov oblik zatvorenosti, novi dogmatizam i novi oblik okovanosti putem posredovanja i procesualnosti. Kateheza i eksploatacija posredovanja i procesualnosti putem *big data* industrije koja danas – na tragu Gatarija (Félix Guattari) – vlada našim post-medijskim dobom, u najmanju ruku oblikuje scenu našeg savremenog otuđenja; i to je ono protiv čega moramo da osmislimo novi, četvrti, zaista ekološki enciklopedizam, koji bi omogućio da se razume novi smisao posredovanja i procesualnosti na ravni evolucije tehničkih objekata i istoričnosti objektnosti ili objektivnosti uopšte, time unapređujući relaciono mišljenje.

Istorijska evolucija objekata – što je najstroži preduslov ekološkog enciklopedizma – je uveliko započela nadilaženje svake objektivnosti kao takve, čime je pojam tehničkog objekta kao takvog postao problematičan ako ne i zastareo zbog vlastitog fundamentalnog „pookolišenja". Mark B.N. Hansen (Mark B.N. Hansen) stoga opisuje sadašnji i budući uslov: „Moramo rekonceptualizovati spoj čoveka i tehnike izvan figure „tehničkog objekta". Pred burom kompjuterskih tehnologija koje vrše raspodelu čulnosti izvan svesti, korelacija između ljudske individuacije i tehnike se izmestila izvan

onoga što bismo mogli misliti kao objektivan stupanj (...) i ušla je u potpuno procesualnu fazu u kojoj tehnika neposredno pojačava sub-perceptualne dimenzije ljudskog iskustva. (...) Tehnički objekt je morao ustupiti mesto tehničkim procesima koji se odvijaju kroz mnogo složenija preklapanja sa ljudskom aktivnošću.“[16] Umesto tehničke posredovanosti opažaja, današnja briga je „više indirektna tehnička posredovanost okolinske osetljivosti“.[17] U kontrastu spram toliko pominjane nove neposrednosti, do koje (opet) dolazimo u doba sveprisutnog računanja, sveprisutnih medija, inteligentnih okolina, i tako dalje, mi se zapravo danas suočavamo sa apsolutnim preimućstvom posredovanja. Rekonceptualizacija procesualnosti i odnosa, ne-subjektivne subjektivnosti i iskustva, koja odgovara ovom novom objektno-istorijskom položaju, te u krajnjem redeskripcija *agensa* i kolektivnosti uslovljenih radikalno tehničkom raspodelom, sve ovo se na kraju svodi na razradu pitanja o tome šta (tehnička) posredovanost danas zapravo znači, kao i na to da se ispravljaju tradicionalni ontološki i epistemološki okviri koji otuda nužno proizilaze: sve to sačinjava zadatak mišljenja u doba četvrtog enciklopedizma, koje će biti ekološko; i upravo je to sadržaj koji stoji iza naziva opšte ekologije.

## Opšta ekologija medija i tehnike

Veliki obrt istorije smisla, u kojem smo obitavali duže od pola veka i koji je uključivao sve moguće univerzume vrednosti i oblasti bića, karakteriše ozbiljna evolucija tehničkih objekata i niz dalekosežnih posledica po kulturu smisla (Sinnkultur). Prvo – u ovome je novi smisao tehnologije – instrument, sprava, oruđe za rad pa čak i mašina, u objektno-istorijskom smislu postaju zastareli. Uz to se posebno obezvređuje sve što podseća na takve sastave objekata, uključujući načelo modela aktivnog subjekta,

njegovu usmerenu akciju ili aktivnu moć i naročitu kulturu smisla usmerenu na značenje; objektnim i svetovnim odnosima preovladavaju instrumentalni, na upotrebu usmereni objekti; a okvir toj na-upotrebu-usmerenoj kulturi smisla, pruža odgovarajuća ontološka shema, naime, hilemorfizam. Transcendentalni subjekt – epitom te tradicionalne kulture smisla koja je, od trenutka vlastitog začeća, i sama u neprestanoj krizi – otkriva se kao nedostižni privid. Drugo – u ovome se sastoji geneza novog smisla samog smisla – postoji paralelan razvoj tehnoloških sklopova i mreža kao novih smernica kulture smisla. Uz te smernice, sastavi suštinski pasivnih objekata aktivnih subjekata, prethodno ključnih za aktivnost kulture smisla, sada se izmeštaju nešto dalje u pozadinu. Jer, tehnički objekti uopšte, sada po prvi put gube vlastiti položaj manjine unutar kulture smisla i dobijaju autonomni i većinski status. Moć akcije se deli između njih i kroz njih te se više ne usredsređuje niti pripisuje aktivno-smislenom subjektu. Disperzija moći se ne tiče samo subjektivnosti i subjekta, nego kao što smo videli uključuje objektivnost i konstituciju samog objekta, naime disperzija u vidu raspodele tehničkih procesa. To podrazumeva aktivne i samo-aktivne, da ne kažem „inteligentne“ tehnološke (u opštem smislu) objekt-kulture, ili radije proces-kulture, koje sve više i više migriraju i uranjaju u našu okolinu, obrazujući našu infrastrukturu, procesuirajući pozadinu naših bića i iskustvo najvećeg kompjuterskog intenziteta, operisanjem u novim, mikro-temporalnim oblastima koje oblikuju lice i logiku savremene kibernetizacije. Savremene tehničke mreže i sklopovi otkrivaju prethodno skrivenu, u načelu izvornu participativnu konstituciju. Time se pokazuju kao agensi iskonskog participativnog stanja, koje sada čine legitimnim. Oni predstavljaju ne-označavajuće, multi-agenalne skupove i u krajnjem iziskuju razradu radikalne, relacione ontologije participacije koja bi obezbedila prikaz

tog stanja. Ona je izvor nove tehnološke kulture smisla – uz višestruke, transverzalne agense izvan centralizacije i monopolizacije aktivno-značenjsko-opažajućeg ljudskog subjekta. Njegovo dekodiranje je izazov s kojim se suočava novi enciklopedizam.[18] Napredniji deo savremenih teorija medija usredsređuje se na ovu okolinsku konstituciju, kojoj teži opšta kibernetizacija. Obim hitne potrebe za ontološkom i epistemološkom rekonceptualizacijom – što se otkriva u ovoj razradi ovde – zauzvrat daje trenutnim medijskim teorijama ključnu ulogu u savremenim teorijskim poduhvatima. Mark Hansen, koji se može nazvati prvim glavnim protagonistom takvog pokušaja, analizirao je radikalizovanu tehničku raspodelu agensa dvadesetprvovekovnih medija kao eksploziju „okolinskog agensa" (namesto prethodno povlašćenih individualnih agensa ljudske subjektivnosti); time je obuhvatio pojmovne razlike ne-reduktivnog shvatanja ne-trivijalnog okolinjaštva.[19] U pogledu višeskalarnih medijalnih okruženja, on naglašava nužnost „radikalnog okolinskog gledišta" na kojem bi se mogla temeljiti „radikalna generalizacija i rekonceptualizacija subjektivnosti" izvan savremenog ljudskog subjekta.[20] Prema Hansenu, zbog kolonizacije svakodnevnog života digitalnim uređajima, pametnim čipovima i senzorima, današnji mediji su se izmestili sa mesta klasičnih medijskih funkcija poput snimanja, skladištenja i prenošenja „do platforme za neposredno međusobno povezivanje koje omogućava sudelovanje sa okolinom". Ovde se menja samo značenje tehnoloških medija i nastaje medijska funkcija bez presedana, koja u krajnjem baca svetlo na apsolutnu neizbežnost posredovanosti i preimućstva tehničkosti: „nedavni razvoj tehničke raspodele, što će reći tehničke infrastrkuture okoline" je po prvi put „osvetlio i omogućio izvorno ljudsko stanje", uspostavljajući ono što Hansen naziva *„našim izvornim okolinskim stanjem".*[21] Hansen je započeo

istraživanje same izvornosti takvog stanja, načina na koji „dvadesetprvovekovni medij – srži savremenih tehnologija snimanja i analize podataka izvan dosega naših ljudskih čulnih aparata što se odvijaju u Libetovom nedostatku pola sekunde".[22] - predstavljaju medije koje vrše *inženjering* samog „čulnog kontinuuma" kroz kojeg se „iskustvo događa"[23] : opažaji, osećanja ili mikro-čulnosti i mikro-temporalnosti se uređuju, razrađuju ili procesuiraju putem okolinske medijske kulture. Zbog toga, potencijalnost kao takva, proces individuacije, zapravo postajanja, mutira u vid medijsko-tehnološkog inženjeringa. „Prosto rečeno, današnji mediji ne ciljaju više na ljudsku subjektivnost kao takvu (opažajnu svest)" nego se pre obraćaju ne-subjektivnoj subjektivnosti u svetskoj mikro-čulnosti.[24]

Lucijana Parisi (Luciana Parisi) (da citiram još jedan bitan glas u medijskoj ekologiji) je isto tako veoma ubedljivo opisala odgovarajuće tehno-medijske konfiguracije koje kibernetizuju moduse čulnosti upotrebom bio-informatičke integracije senzora, mobilnih medija i digitalnih atmosfera kao „tehno-ekologije osećaja"[25] Oslonivši se na Linov Margulusov pojam ekologije simbiogeneze (autopoietske ekologije „zajednice mikroorganizama od kojih smo sačinjeni", u širem smislu izvorne ekologije živih, koja se odnosi i na mikro- i na makro- ravan, i važi za prokariote koliko i za autopoietsku planetu Gaia, i takođe uključuje medije i tehnologiju), Parisi opisuje novu kibernetsku afetkivnost koja spaja biološko sa digitalnim, u vidu „simbiosenzacije: iskustva ne-čulne povezanosti između organske i neorganske tvari koja dodaje novi gradijent osećanja u mislećem mesu."[26] U ranim radovima o „novoj digitalnoj matrici" našeg doba algoritama i novih računarskih estetika, koje odlikuje obrada većeg kvantiteta podataka poput algoritama koji otkrivaju nove, ne-ljudske faktore, Parisi se okrenula analizi takozvanih „algoritamskih okruženja" – računarskih okruženja

obilatih algoritamskim objektima. Kibernetizacija medija ih je obratila od „artikulacije (ljudskog) izraza, ili od estetske moći (…) modulacije efekata“ u „obuhvatne mašine onoga što se ne može artikulisati niti predstaviti.“[27]

Jusi Parika (Jussi Parikka) je opisao digitalnu kulturu kao univerzalnu viralnu mašinu. Analizirao je viralne kodove kao ne-ljudske aktere i kao konstitutivni deo „opšte medijske ekologije internet kulture“[28] kao „entitete svojstvene medijskoj ekologiji digitalnog kapitalizma.“[29] On je razvio „pojmovnu perspektivu medija kao ekologije“[30] u svetlu savremenog medijskog stanja: njegov prikaz „neprirodnih ekologija“ ga je naveo da razradi ono što je nazvao „milje-pristupom“ - mapiranje medija „izvan uobičajenih granica tehnologije i ljudskih namera“[31] kao „intenzivne sposobnosti što temelji svetove“ i kao „mozgove u kojima se skupljaju snage kosmosa, koji uspostavljaju ravan iznad haosa.“[32] „Mediji“, piše on, „okupljaju sile, ali i deluju kao prolaz i modus kojim se pojačavaju osećaji, opažaji i misli“.[33] Ukoliko je do sada Parika upotrebljavao medijsku ekologiju pre svega kao drugi medij etologije živih, utoliko se od sada bavi komplementarnim aspektom medijske geologije neživih, nekom vrstom medijske istorije dubokog vremena materije, minerala i podzemlja naše medijske kulture.[34]

Najzad, da pomenem poslednji primer, Bernar Stiglerova (Bernard Stiegler) farmakologija trenutnog medijsko-tehnološkog stanja, i njegova kritika sa tim povezanog hiperindustrijskog sistema iskustva i simbolične, estetske i duhovne bede koju taj sistem proizvodi, bavi se problemom sve većeg uništavanja uma, te psihičke i kolektivne dezindividuacije izazvane sistematskom eksploatacijom, iscrpljivanjem, i uništavanjem želje. On radi na reformulaciji političke ekonomije kao libidinalne ekonomije sublimacije i proizvodnje duhovnih vrednosti koja – ovo je ono što treba istaći – naglašava izvornu tehničkost

odnosa između objekata i prvobitnu veštačkost želje što je u srži ekonomije. Stigleova analiza pokazuje da se raspodela tehničkog miljea trenutnih procesa individuacije i dezindividuacije sada sve više prepoznaje kao libidinalna ekologija, ili, kako kaže, kao „*ekologija* duha.“[35] Cela Stigleova farmakologija nege vrti se oko nove ekologije, koja se može shvatiti trostruko, kao „re-artikulacija psihičke, kolektivne i tehničke individualizacije.“[36]

Mogu se navesti brojne neo-ekološke studije, od Katerine Hajlesove (Katherine Hayles) i njenog opisa tehnološke kognicije;[37] preko Dirk Bekerovog (Dirk Baecker) novog društva kompjutera nad kojim vlada „ekološki princip“[38] Brajan Masumijeva (Brian Massumi) istraživanja „okolinjaštva“ i savremene „ekologije moći“[39] kao nastanka našeg oblika upravljaštva; do Metju Fulerove (Matthew Fuller) neo-materijalističke medijske ekologije.[40] Ova programska otkrića pokazuju koliko se oko pojma ekologije razvija i kristalizuje nova semantika koja opisuje savremeno tehno-medijsko stanje. Utoliko se i sam pojam ekologije postavlja u procese izmeštanja, reformulacije te i revaluacije. Naime, ovo nije samo puka metaforizacija izraza koji bi, po svojoj prvobitnoj definiciji, bio ograničen samo na biološko, etološko, ili životno-naučno polje. Sasvim suprotno, pre će biti da je tradicionalni pojam ili govor ekologije izazvao prodor te da načelno oblikuje pojmovni splet što se kao posledica tehno-medijskog razvoja uzdiže na nivo kritičke intuicije i modela opisa ove fundamentalno nove pozicije. Kangijem (Georges Canguilhem) je ovo predosetio još 1947. kada je pisao: „Pojam miljea postaje univerzalan i obavezan modus shvatanja iskustva i postojanja živih bića; skoro pa se može reći da se on utemeljio kao kategorija savremene misli.“[41]

Bilo je mnogo pokušaja pojmovnog suočavanja upravo sa tim novim tehno-ekološkim smislom smisla, kojeg ključne razlike i premise samog doba smisla

više ne mogu obuhvatiti. Ovi pokušaji su razvili pojmove poput skupine, sklopa, montaže, kompozicije, hetero-geneze, simbiogeneze, bivati-sa (*être-avec, Mit-Sein*), bivati-zajedno (*être-ensemble*), pojavljivati-se-zajedno/sa-javljati-se *(compearance, comparution)*, za agense ili spletove ljudskih i neljudskih entiteta ili činioca. Jedan od pravih izazova i glavnih tačaka današnje pojmovne politike je da se tokom godina potpuno redefinišu temelji kulture smisla, koji su kolektivno počeli da uspostavljaju novu opštu ekologiju kao i osnovu na kojoj bi mogle da se razviju potonje epistemološke i ontološke reforme. Složio bih se da je ovo mesto na kojem su se odvile glavne pojmovne i teorijsko-političke borbe i inovacije prošle decenije, kao i da je to takođe mesto sve njihove snage. Žan-Lik Nansi je razvio bitan pokušaj redeskripcije, pošto je radio više od četvrt veka na izvrtanju temelja smisla kroz tehnologiju. Sve do nedavno, u Nansijevom radu je bez sumnje postojala fiksacija sa ljudskim akterim i agensima, što je određivalo njegovo promišljanje „bivanja-sa" i time neizbežno otkrivalo granice njegovog mišljenja tehnologije i refleksije istoričnosti smisla. U delu „De la struction" on pak napušta upravo tu fiksaciju zarad kosmo-političkog ako ne već kosmo-tehnološkog stanja. Sada je u nekom smislu uspostavio novo shvatanje tehničkosti „bivanja-sa" i, stavljajući ga na istu ravan sa našim tehnološkim stanjem, razvio je i novi smisaono-istorijski položaj koji shvata kao suštinski raspodeljenu pojavu: „Ono što nam je dato sastoji se u naspramnosti i istovremenosti sa-prisutnosti, čije „sa" nema posebno značenje izvan graničenja ili naspramnosti unutar granica samog univerzuma."[42] Upravo će se u toj ekspoziciji „strukcije" – „struo" u smislu akumulacije *(ammaser)* ili sakupljanja *(entasser)* – moći izvući „pouka tehnologije", prema Nansiju. U dobu tehnologija – ovo je ključno mesto – javlja se „promena, savijanje fenomenološkog dispozi-

tiva", u toku koje puko pojavljivanje-sa/kompuracija počinje da važi za „smisao sveta".[43] Nije više reč, kao što je bilo pre, o egzistencijalnom (i time antropocentričkom), već pre o jednom kategorijskom „sa". Ovo otkrovenje (u smislu razgolićenosti) prema Nansiju, označava upravo smisleno-istorijski položaj „strukcije" u kojoj smo svi (re)locirani kroz tehniku i na osnovu toga je na nama da „otkrijemo sve, a iznad svega sam smisao".[44] Ubrzo potom on je dalje produbio ovu lekciju otkrivši „katastrofu smisla" sa kojom smo suočeni, i time je izrazio „postajanje-katastrofalnim" (*Katastrophisch-Werden*) samog smisla, „samo-izmeštanje" (*Sich-Wenden*), „u-sukobu-bivanje-shvaćenim" (*Im-Umsturz-begriffen-sein*), „urušavanje-jedno-u-drugom" (*Auf-einander-Einstürzen*) kao srž velike smisaono-istorijske transformacije.[45] Na osnovu „međupovezanosti" on je na kraju uvideo glavnu crtu današnjeg stanja u opštoj ekologiji smisla: Nansi jasno naglašava da se ovo tiče jednog vida poopštavanja pojma okruženja u toku kojeg se sve okružuje, uokviruje i razvija prema međupovezanosti onoga što se nazivalo tehnološkim nesvesnim – „nesvesno" pre svega u smislu „isprepletene tkanine samog bića".[46] Dok je Nansi prethodno upotrebljavao pojam „eko-tehnike" (*écotechnie*) da bi opisao opšte postajanje-tehničkim sveta, sada je napokon opšta ekologija ta koja se sama predstavlja kao tačka oslonca naše duboko tehnicizovane kulture smisla. Prosto rečeno, savremeni smisaono-istorijski položaj je u opštem smislu, okolinski.

Ako je opšta ekologizacija stoga predstavljala značajan momenat u kretanju našeg doba i ako ona vodi, u novom tehnološkom stanju, do nove ekološke paradigme – da se prisetimo Feliks Gatarija – onda to podrazumeva dalekosežno prevrednovanje smisla ekologije. Govor o ekologiji je iznova prizivao figure neoštećenosti i neozleđenosti, netaknutosti, figure čitavog i imunog, celog i svetog.

On je deo „reakcije na mašinu" te iskorenjavanja, delokalizacije i eksproprijacije što su proistekli iz onoga što je Derida (Jacques Derrida) nazvao „tele-tehno-naučnom mašinom"[47]: tog nepokolebljivog „nagona da se ostane netaknutim"[48], figuracije sopstva, uvek poželjnim bivanja-sa-samim-sobom (*Bei-sichsein*) i bivanje-u-kući (*Zu-Hause-sein*), tako da se on odnosi samo na ograničenu ekologiju — ekologiju religije. S druge strane, opšta ekologija, koja se usred prevrednovanja smisla ekologije razvija u sledeće glavno ekološko načelo, podređena je drugoj, drukčijoj ekonomiji. Ovo je neprirodna, iz-van-prirodna, i može se reći supstraktivna ekologija: ekologija koja uklanja imunopolitike ekologije.[49] To je ekologija prirodno-tehničkog kontinuuma, koju opšte „pookolišavanje" putem tehnologije i tehno-nauka i prateće eksplozije agenasa, shematizuje kao srž naših trenutnih, i štaviše, naših budućih osnovnih iskustava.[50]

## Divlje ekologije

Francuski psihoanalitičar i teoretičar Feliks Gatari pokušao je krajem sedamdesetih da prevede i pretvori ovaj pokret u filozofsko-politički program. Ne samo da je opisao heterogenetičku predstavu bića koja važi i danas — uz kreativne procese i pojave — nego je na kraju prizvao i novu predstavu same misli: misli koja prethodi pojmovima ličnosti i objektivnosti, koja nalikuje logici primarnih procesa — poliva-lentnoj „eko-logici".[51] Razvoj ove „nove ekozofske logike"[52] dodeljen je zadatku „mentalne ekologije", koji se već probio i kroz kolektivno-socijalnu ekolog-iju i kroz materijalno-tehnološku ekologiju i koji je već bio u mogućnosti da ocrta opštu ekologizaciju. Ipak, pozadina svih ovih težnji, prema Gatariju (i ne samo njemu), uslovljena je pretežno razvojem medijsko-tehnoloških pitanja: na temelju potenci-jalnih post-medijskih praksi — od videa, piratskog

radia do video teksta/minitela, interaktivnih baza podataka, i na kraju kompjutera — Gatari je razvio interes prevashodno za nastanak novih oblika one subjektivnosti koja je odvojena ne samo od neke ličnosti ili subjekta nego i od čoveka samog, koja naročito podriva one subjektivnosti koje su serijske, standardizovane i normalizovane putem masovnih medija. U krajnjem, prema Gatariju — i ovo je ključno — „animističke kartografije subjektivnosti"[53] bi trebalo da uzmu u obzir ne-subjektivne subjektivnosti koje su podeljene u mnoštvu odnosa. Gatari je tvrdio da je ono što medijske tehnologije uvode zapravo „mašinski animizam"[54], ono što bih ja nazvao tehno- i medijskim animizmom, pošto se ovo postajanje-određenim može izraziti kroz izvesnu sličnost i re-zonancu sa ne-modernim, radikalno participativnim sklopovima divljih animizama, odn. sklopovima ili kolektivima u kojima prednjači participacija kao pri-marni i konstitutivni odnos. Glavna intuicija sa kojom se enciklopedizam sadašnjice mora uklopiti, sa ko-jom se mora povezati i koju mora izgraditi u punom smislu, jeste intuicija viralnosti i valencije pojma participacije i poimanja strogo relacionog mišljenja: samo se ovo potonje može izboriti sa modusima subjektivnosti i objektivnosti čija raspodela se vrši kroz okolinske medijske tehnologije i sa nepobitno multi-agensnom, raspodeljenom prirodom agenasa koje ona podrazumeva. Još 1938. godine je veliki teoretičar primitivnog mentaliteta i mentor radika-lno participativnog mišljenja, Lisjen Levi-Brul (Lucien Lévy-Bruhl), u svojim *Cahiers* napisao sledeće: „Za primitivni mentalitet, *biti znači participirati*."[55] Ovom izjavom, on je utemeljio moto opisa divljeg Bića i njegovog ne-alfabetskog smisla, koji danas, na os-novu medijskih tehnologija, stiče začuđujuću aktu-alnost i ponovo dobija na značaju.[56] Sve veći broj neo-animista današnjice, koji proučavaju alterna-tivna poimanja kolektiva, pripadnosti, srodstva i ko-smologija — od Bruno Latura (Bruno Latour), Izabel

Stengers (Isabelle Stengers), Dona Haravej (Donna Haraway) kroz čitav spektar post-humanističkih pristupa – svedoči tome. Postoji naročito jak interes za animizam unutar etnologije i socijalne antropologije – dovoljno je samo da napomenem Nuritu Bird-Davida (Nurit Bird-David), Filipa Deskolu (Philippe Descola), Eduarda Viverosa de Kastra (Eduardo Viveiros de Castro), Alfa Hornboga (Alf Hornbog) i Tima Ingolda (Tim Ingold); iako je svaki od njihovih prilaza drugačiji, ono što im je zajedničko jeste predstavljanje animističkih sistema kao radikalnih, relacionih ontologija i epistemologija. Čini se da se ovi čisto relacioni sistemi ponašaju kao alternativne kartografije ne-savremenom redefinisanju našeg sadašnjeg i budućeg tehnološkog sveta. Divlje kosmologije mogu poslužiti kao meta-modeli hitne kosmo-tehnološke rekonceptualizacije participacije kao konstitutivne relacionalnosti i samim tim i agensa, odnosa i odnošenja, iskustva i subjektivnosti te svega što nam je potrebno da bismo razumeli vlastito sada-ne-odbačeno izvorno ekološko stanje u ne-redukcionističkom smislu. Kao što je Viveros de Kastro rekao, potrebne su nam „bogatije ontologije"[57] u odnosu na one tradicionalne, na osnovu kojih možemo opisati ovo stanje.[58] Ali istovremeno, naravno da je bitno prići ovim pitanjima i pooštriti ih kontra-animistički, da bi se ostalo na oprezu za nove oblike participacije, koje bar u (neo)animističkom smislu prevazilaze vladajuću usmerenost na moduse pripadanja, idejom prekinutog pripadanja, participacije bez participacije, na primer – imitacije.[59]

Simondon (da mu se vratim još jednom pre nego što završim) je u izvesnom smislu isto pionir ovog ne-savremenog mapiranja okolinjaštva. Postavljajući pitanje participacije kao centralno pitanje opšte ekološke konstitucije, što ga je navelo da razvije čitavu metafiziku participacije, uočio je bar u njenom rudimentarnom obliku, novu animističku dispozic-iju. Njegova evolutivna teorija tehničkih objekata ne započinje prosto sa nekim izvornim „magičnim jedinstvom": ovo potonje se opisuje kao „odnos ključnog spoja između čoveka i sveta, što određuje univerzum koji istovremeno prethodi svakoj podeli između objekata i subjekata i samim tim svakoj pojavi odvojenog objekta"[60]; dok se ovde apsolutno ništa ne dešava bez posredovanja: on naglašava da se „posredovanje još uvek nije ni subjektiviralo ni objektiviralo", te da se sastoji ni od čega drugog do „najprostijih i najfundamentalnijih strukturacija miljea živih entiteta."[61] U tom smislu, animistički sistemi su uvek načini da se predstavi izvorno i neizbežno posredovanje. Ali Simondon je takođe razmišljao izvan ovakve vrste izmeštenog vraćanja tog stanja unutar naše radikalno tehno-ekološke formacije, koja je uvela pre-subjektivnu i pre-objektivnu dinamiku mreže miljea koje se uvek razvijaju i koji su uvek u toku postajanja (umesto oslanjanja na fiksiranu strukturu) – i koji upravo sami predstavljaju agense strukturiranja i oblikovanja naše savremene egzistencije i iskustva. Naravno, Simondon tada nije mogao ni definisati to u punom smislu – sveprisutnost tih miljea, kao ono što će započeti totalnu kibernetizaciju. „Prihvatajući čitav opseg mreža, tehnička realnost okreće leđa kraju svoje evolucije prema miljeu koji određuje i strukturira (ili pre, teksturira), uzimajući u vidu njegove opšte linije; tehnička realnost se još jednom pripaja svetu, ovog puta u vidu polazne tačke, pre oruđa i instrumenta."[62]

To ne znači tvrditi da smo ikada mogli biti animistički, niti da ćemo to ikada biti. To je pre svega pitanje o mnoštvu manjih ekologija čiji opisi počinju pod ovim naslovom i koje tek danas možemo početi da obuhvatamo, u svetlu opšte-ekoloških napora sa punom snagom modelovanja ne-savremenog rada mapiranja sadašnjice i nastajućeg tehno-medijskog sveta. To je pitanje onoga što sasvim sigurno leži u srcu ekološkog enciklopedizma – hiljadu ekologija.

1. Michel Deguy, Écologiques (Paris: Hermann, 2012), 31.

2. Martin Heidegger, "The End of Philosophy and the Task of Thinking," (1964) in Martin Heidegger, *Basic Writings*, ed. David F. Krell (San Francisco: Harper, 1977), 373–92. Takođe vidi: Erich Hörl, "Das kybernetische Bild des Denkens," in *DieTransformation des Humanen. Beiträge zur Kulturgeschichte der Kybernetik,* eds. Michael Hagner and Erich Hörl (Frankfurt am Main: Suhrkamp, 2008), 163–95; Radi opisa fundamentalne ambivalentnosti u Hajdegerovom čitanju kibernetike, u kojem kibernetika ne predstavlja niti samo uvodi kraj doba „uokviravanja" (Gestell) nego i ulazak u novu epohu u istoriji bića. Vidi: Erich Hörl, "Die offene Maschine. Heidegger, Günther und Simondon über die technologische Bedingung," *Modern Language Notes,* vol. 123 (2008): 194–217.

3. Hajdeger ima neverovatnu dijagnostičku intuiciju za nadolazeće kibernetsko doba, što njegovo mišljenje po tom pitanju čini vrednim. Ipak, on nije razvio sistematsku studiju „istoričnosti" oruđa (Zeug), premda je često aludirao na to da ona sadrži mnoštvo era ili epoha poput „istoričnosti" Bića. Vidi: Hubert Dreyfus "Heidegger's History of the Being of Equipment," *in Heidegger: A Critical Reader,* eds. Hubert Dreyfus and Harrison Hall (Oxford: Blackwell, 1992), 173–85.

4. Termin "environmentality" ovde se prevodi kao „okolinjaštvo " po analogiji sa Fukoovim (Michel Foucault) pojmom „upravljaštvo" ("gouvernmentalité" odnosno "governmentality") na koji se i oslanja. "Environmentality" označava primenu Fukoovog pojma biomoći i upravljaštva na analizu regulacije društvenih odnosa prema prirodi. Ovaj pojam se odnosi i na Fukoova genealoška istraživanja države koja bi trebalo da uključuju ekološke racionalnosti i tehnologije upravljanja.

5. Što se tiče Hajdegerovog antropocentrizma, kao i unutrašnja ograničenja antropocentričkog poimanja okolinjaštva (Umweltlichkeit), vidi: Jean-Hugues Barthélémy, "La question de la non-anthropologie," *in Technique, monde, individuation. Heidegger, Simondon, Deleuze,* ed. Jean-Marie Vaysse (Hildesheim: Olms, 2006), 117–32; Jacques Derrida, *The Animal That Therefore I Am*, ed. Marie-Louise Mallet, trans. David Wills (New York: Fordham University Press, 2008), 141–60; Giorgio Agamben, *The Open: Man and Animal*, trans. Kevin Attell (Stanford, CA.: Stanford University Press, 2004); Radi pojma neokibernetike vidi: Bruce Clarke and Mark B. N. Hansen (eds.), "Neocybernetic Emergence," in *Emergence and Emboment: New Essays on Second-Order Systems Theory* (Durham, NC.: Duke University Press, 2009), 1–25.

6. Timoti Morton (Timothy Morton), svojom čuvenom frazom „Ekologija bez prirode" suprotstavlja se fundamentalno „ekologo-centričkom" uverenju koje meša ekologiju i prirodu (koju shvata u savremenom smislu kao antonim tehnologiji i kulturi, kao ekvilibrijum, stanje kojem je vredno vratiti se). Morton zanemaruje ili maši objekt-istorijsku osnovu vlastite kritike ekologo-centrizma, odn. pitanje istoričnosti pojma same prirode i njene potencijalne – i nužne – rekonceptualizacije. Vidi: Timothy Morton, "Ecologocentrism: Unworking Animals," *SubStance*, issue 117, vol. 37.3 (2008): 73–96.

7. Trejsi B. Strong (Tracy B. Strong) prevodi komparutaciju upotrebivši poznati škotski pravni izraz "compearance" koji se odnosi na čin pojavljivanja u sudu. Vidi: Jean-Luc Nancy and Tracy B. Strong, "La Comparution/The Compearance: From the Existence of 'Communism' to the Community of 'Existence,'" Political Theory, vol. 20, no. 3 (August 1992): 371–98.

8. Gilbert Simondon, "The Genesis of the Individual," in Incorporations, eds. Jonathan Crary and Sanford Kwinter (New York: Zone Books, 1992): 312.

9. Didier Debaise, "What is relational thinking?" in Inflexions, no. 5 (2012): 1–11.

10. Mark B. N. Hansen predstavio je prvobitnu razradu ovog polja u "Engineering Preindividual Potentiality: Technics, Transindividuation, and 21st-Century Media," SubStance, issue 129, vol. 41.3 (November 2012): 32–59; takođe vidi moj članak, "Simondon's General Ecology" (u pripremi).

11. Gilbert Simondon, Du Mode d'Existence des Objets Techniques (Paris: Éditions Aubier, 2005 [1958] ), 95–6.

12. Transindividualnost je "odnos, koji povezuje individue ne putem konstitutivne individualnosti što ih izvorno razdvaja jedne od drugih, niti putem onoga što je identično u svakom ljudskom subjektu poput a priornih formi čulnog opažanja, nego preko naboja pred-individualne stvarnosti, prirodnog naboja koji ostaje očuvan pored individualnog bića i koji sadrži potencijalnosti i virtualnost." (Ibid., 248) Tehnički objekt kao izum je ujedno simbol i motor transindividualnog odnosa. (Vidi takođe ibid., 247).

13. Ibid., 104. Radi pojma otvorenog objekta, vidi Gilbert Simondon, "Technical Mentality," in Gilbert Simondon: Being and Technology, ed. Arne de Boever et al. ( Edinburgh: Edinburgh University Press, 2012), 1–118.

14. Simondon, Du Mode d'Existence des Objets Techniques, op. cit., 103.

15. Ibid., 106.

16. Hansen, "Engineering Pre-Individual Potentiality," op. cit., 51 i 55.

17. Ibid., 48.

18. Radi detaljnijeg opisa tehnološkog izmeštanja smisla, vidi: Erich Hörl (ed.), Die technologische Bedingung. Beiträge zur Beschreibung der technischen Welt (Berlin: Suhrkamp, 2011), 7–53, a naročito 7–23.

19. Mark B. N. Hansen, "System-Environment-Hybrids," in Bruce Clarke and Mark B. N. Hansen (eds.), op. cit., 113–42.

20. Mark B. N. Hansen, "Medien des 21. Jahrhunderts, technisches Empfinden und unsere originäre Umweltbedignung," in Die technologische Bedingung, ed. Erich Hörl, op. cit., 367.

21. Hansen, "Engineering Pre-individual Potentiality," op. cit., 33.

22. Ibid., 57.

23. Ibid., 56.

24. Ibid. 57. Vidi takođe Mark Hansen, "Ubiquitous Sensation: Toward an Atmospheric, Collective, i Microtemporal Model of Media," in Throughout: Art and Culture Emerging with Ubiquitous Computing, ed. Ulrik Eman (Cambridge, MA.: MIT Press, 2013), 63–88.

25. Luciana Parisi, "Technoecologies of Sensation," in Deleuze Guattari & Ecologies, ed. Bernd Herzogenrath (New York: Palgrave, 2009), 182–99.

26. Ibid., 192.

27. Luciana Parisi/Erich Hörl, "Was heißt Medienästhetik? Ein Gespräch über algorithmische Ästhetik, automatisches Denken und die postkybernetische Logik der Computation," Zeitschrift für Medienwissenschaft (ZfM), no. 1 (April 2013): 35–51.

28. Jussi Parikka, Digital Contagion (New York: Peter Lang, 2007), 10.

29. Ibid., 5.

30. Ibid.

31. Jussi Parikka, Insect Media: An Archaeology of Animals and Technology (Minneapolis: Minnesota University Press, 2010), xviii.

32. Ibid., xxvii.

33. Ibid., xxvi.

34. Parika je razvila ovo stanovište tokom predavanja na Bochum Colloquium for Media Studies (bkm) 16, januara 2013, pod naslovom: "An Alternative Deep Time of The Media: A Geologically Tuned Media Ecology."

35. Bernard Stiegler/Frédéric Neyrat, "Interview: From Libidinal Economy to the Ecology of the Spirit," Parrhesia, no. 14 (2012): 9–15. See also Erich Hörl, "Wunsch und Technik. Stieglers Genealogie des Begehrens," in Bernard Stiegler, Hypermaterialität und Psychomacht, ed. Erich Hörl (Zurich: diaphanes, 2010), 7–33.

36. Ibid. Dominic Pettman, in Human Error: Species-Being and Media Machines (Minneapolis: University of Minnesota Press, 2011), 171–77 naglašava antropocentrički naglasak Stigleove ključne razlike između désir (želje) i pulsion (nagona). Prema Stigleu, ljudi su libidalne životinje: samo ljudi imaju želje i samo su oni sposobni za sublimiranje nagona u želju, dok se životinje vode instinktima i nagonima. Valja još razraditi odnos između nagona i instikata. Ali ova antropocentrička pristrasnost koja je zapravo već upisana u Stigleovo mišljenje izvorne tehničkosti čoveka kao fundamentalne prvobitnosti greške/pada i nedostatka.Ova ključna figura u njegovoj teoriji tehnike i želje mora se čitati istovremeno kao de-antropologizujuća i re-antropologizujuća operacija. Ta antropocentrička obeležja u Stigleovoj libidalnoj ekologiji predstavljaju unutrašnju granicu njegove ekologije, koja je uvek već obuzdava, savijajući je natrag od opšte ka ograničenoj ekologiji. Stigleova odanost pojmu (tehničkog) objekta do tačke ulaska u proces-kulturu ponavlja ovu istu političko-teorijsku proceduru. Zato ne iznenađuje što njegova teorija vodi sve više i više ka neo-humanističkom stanovištu čiji se preostali antropocentrički sadržaj mora razmotriti i razjasniti.

37. Katherine Hayles, How We Think: Digital Media And Contemporary Technogenesis (Chicago: University of Chicago Press, 2012)

38. Dirk Baecker, Studien zur nächsten Gesellschaft (Frankfurt am Main: Suhrkamp, 2007), 225.

39. Brian Massumi, "National Enterprise Emergency: Steps Towards an Ecology of Powers," Theory, Culture & Society, vol. 26, issue 6 (2009): 153–85.

40. Matthew Fuller, Media Ecologies: Materialist Energies in Art and Technoculture (Cambridge, MA.: MIT Press, 2005).

41. Georges Canguilhem, "The Living and Its Milieu," in The Knowledge of Life, eds. Paola Marrati and Todd Meyers (New York: Fordham University Press, 2008), 98.

42. Jean-Luc Nancy, "Von der Struktion," in Die technologische Bedingung, ed. Erich Hörl, op. cit., 54–72, 63.

43. Ibid., 66f

44. Ibid., 72

45. Cf. Jean-Luc Nancy, L'Équivalence des catastrophes (Après Fukushima) (Paris: Galilée, 2012), 20.

46. Ibid., 59

47. Jacques Derrida "Faith and Knowledge: The Two Sources of 'Religion' at the Limits of Reason Alone," trans. Samuel Weber, in Religion, ed. Jacques Derrida and Gianni Vattimo (Stanford, CA.: Stanford University Press, 1998). Radi ključnog teksta o imunopolitikama netaknutih, vidi: Frédéric Neyrat, Biopolitique des Catastrophes (Paris: Éditions MF, 2008); i isto tako njegovu knjigu: L'Indemne. Heidegger et la destruction du monde (Paris: sens et tonka éditeurs, 2008).

48. Derrida "Faith and Knowledge," op. cit., 45.

49. Oklevam da ih nazovem onako kako je to rekao Timoti Morton: "ekologijom bez prirode". To nije samo pitanje odbacivanja prirode kao takve nego pitanje novog mišljenja i rekonceptualizacije prirode; naime, kao prirode-tehnike sa kojom nas suočava nužnost opšte ekologije. Oni koji slave kraj prirode pogrešno sude o njenoj istoričnosti. U odnosu na mogućnost spekulativnog pogleda na prirodu na nivou tehnološke uslovljenosti, poput Simondonove pred-individualne prirode, vidi npr. Debaise's "What is relational thinking?" op. cit.

50. Iako je razlika između opšte i ograničene ekologije zapravo sistematska razlika – formulisana s obzirom na Batajevu (Georges Bataille) razliku između opšte i ograničene ekonomije smisla – postoji takođe i istorijska pristrasnost unutar ove distinkcije. Mislim da imamo tendenciju da se krećemo od ograničene ka opštoj ekologiji, bar u okviru pojmovne i političke teorije. Ponovno iščitavanje Bataja bi pokazalo da je njegova opšta ekonomija zapravo već opšta ekologija. Dovoljno je samo da napomenem tekst "L'économie à la mesure de l'univers" (1946) u kojem govori o „principu samog života" koji predstavlja ekonomiju sunca, i čak "le sens du soleil,", smisao sunca. Puno hvala Dejvidu Vilsu na naglašavanju koliko ovaj odnos između opšte ekonomije i opšte ekologije zaslužuje dalju razradu.

51. Félix Guattari, The Three Ecologies, trans. Ian Pindar and Paul Sutton (London: Continuum, 2005 [1989] ), 30. Radi heterogenetičke predstave bića, vidi: "The new aesthetic paradigm," in Félix Guattari, Chaosmosis, trans. Paul Bains and Julian Pefanis (Bloomington: Indiana University Press, 1995 [1992] ), 98–118.

52. Guattari, The Three Ecologies, op. cit., 34.

53. Félix Guattari, "Entering the Post- Media Era," in Félix Guattari, Soft Subversions. Texts and Interviews 1977–1985, ed. Sylvère Lotringer (Los Angeles: Semiotext(e), 2009), 301–6: 302.

54. Vidi takođe: Angela Melitopoulos and Maurizio Lazzarato, "Machinic Animism," in Animism (Volume I), ed. Anselm Franke (Berlin: Sternberg Press, 2010), 97–108.

55. Lucien Lévy-Bruhl, Carnets (Paris: Presses universitaires de France, 1949), 22.

56. U mojoj knjizi Die heiligen Kanäle. Über die archaische Illusion der Kommunikation (Berlin: diaphanes, 2005), šire sam opisao opseg I razvoj pojma animiza s kraja devetnaestog veka i početka dvadesetog, a naročito u delu Levi-Brula, koje je već predstavljalo reakciju na razvoj suštinski ne-alfabetskih transmisionih kultura, i to je već bila prva istorijski marginalizovana indikacija post-alfabetskog stanja.

57. Eduardo Viveiros de Castro, "Exchanging Perspectives: The Transformation of Objects into Subjects in Amerindian Ontologies," in Franke (ed.), Animism, op.

cit., 227–43.

58. Još 1988.  Paul Bosijak (Paul Bouissac) je primetio "tendenciju prema naučno zasnovanom neo-animizmu koji bi radikalno izmenio ne samo držanje savremenih ljudi prema životinjama, nego i čitav splet kulturalnih definicija i filozofskih pret-postavki na kojima je sazdana čitava dvadesetovekovna globalna civilizacija." Takođe je govorio o  "izmeštanju kosmologije koji se čini preduslovom za skre-tanje ljudske radinosti u prilagodljiviji smer." (Paul Bouissac, "What is a human? Ecological semiotics and the new animism," in Semiotica, vol. 77, no. 4 (1989): 497–516, here 514.)

59. Zahvaljujem Marku B. N. Hansenu pošto je pomenuo ovaj problem u jednom našem razgovoru.

60. Simondon, Du Mode d'Existence des Objets Techniques, op. cit., 163.

61. Ibid.

62. Gilbert Simondon, L'Invention dans les techniques. Cours et conférences, ed. Jean- Yves Chateau (Paris: Seuil, 2005), 101.

*Prevod sa engleskog Aleksandar Matković*

# Ono čemu se odupireš istrajava:

# Automatizacija, automatizam i autonomizacija

Sledeći esej sačinjava jedan pokušaj skiciranja tri pojma, a najefektivnije bi bilo konkretno se fokusirati na 'autonomizaciju'. Autonomizacija je pojam koji sam prvi put primetio u radu Frederika Džejmsona (Frederic Jameson), tačnije u njegovom članku 'Kulturni i finansijski kapital'. Ipak, pojam se takođe pojavljuje u kasnim spisima Feliksa Gatarija (Félix Guattari) kao i u spisima levih-komunista Žaka Kamatea, Kornelijusa (Jacques Camatte) Kastorijadisa (Cornelius Castoriadis) i Francuskog kolektiva, teoretičara komunizacije, Theorie Communiste.[1]

U radu Frederika Džejmsona, autonomizacija ima najmanje dva bitna značenja, prvo je vezano za kontinuitet oblika kapitalizma od Fordizma do finansijalizacije (preko Tejlorizma). Drugo, koje se tiče onoga što Hari Braverman (Harry Braverman) naziva 'habituacijom' i onoga što raskida sa tim. I jedan i drugi način bavljenja ovim pojmom biće povezani sa debatama u polju estetike i razlog za to je sledeći: suprotno diskursima koji se tiču političke autonomije, ove estetičke debate stavljaju naglasak na rad kroz izvršavanje rada i određenost ljudske vrste pod kapitalizmom (njenu neslobodu i otuđenost), tražeći izlaz kroz sam kapitalizam, a ne van njega.

U Džejmsonovim spisima termin se pojavljuje u sličnim odeljcima u *Brehtu i Metodi* (1998) i *Zatvorskoj kući Jezika* (1972), (o strukturalizmu i ruskomformalizmu). Oslanjajući se na studiju Harija Bravermana, *Radni i Monopolski Kapital,* Džejmson, pokušavajući da razvije teoriju 'modernističkih formalnih procesa', postavlja Modernizam kao kulturalni odgovor na intenzifikaciju 'postvarenja' (kao što je to bio realizam pre njega).[2]

Nalazim da je interesantno i produktivno videti ovaj posebni proces u smislu autonomizacije: nekadašnji delovi celine sada su postali nezavisni i samodovoljni. To je nešto što možemo primetiti u poglavljima i njihovim podepizodama u *Uliksu*, kao i u prustovskoj rečenici. Ovde sam želeo da uspostavim srodstvo, ne toliko sa naukama [...], koliko sa samim procesom

rada. I ovde se veliki fenomen tejlorizma (savremen sa modernizmom) polako nameće: podela rada (teoretizovana mnogo ranije još kod Adama Smita (Adam Smith)) sada postaje metod masovne proizvodnje sam za sebe, preko odvajanja različitih nivoa i njihove reorganizacije oko principa efikasnosti.[3]

Možda se preko estetskog rada lajn-densing šou igračica, Tajler Grls, mnogo bolje može zamisliti veza između tejlorizacije i modernizma, nego što se to može putem literature, kao što je to opisao Zigfrid Krojcer (Seigfried Kracauer). Ti masovni spektakli drilovanja 'devojačkih-jedinica' su:

[...] smišljeni prema racionalnim principima koje je Tejlorov sistem gotovo pogurao do njihovih krajnjih mogućnosti. Ruke u fabrici odgovaraju nogama igračica iz Tajler Grlsa

[...] masovni ornament je estetski refleks racionalnosti ka kojoj vladajući ekonomski sistem teži.[4]

### Promiskuitentni produktivizam

Tejlorizam je centralan za Bravermanovu studiju o razvijanju procesa rada tokom dvadesetog stoleća. I to zbog toga što on veruje da: 'Tejlorizam [...] nije ništa manje do li eksplicitna verbalizacija kapitalističkog načina proizvodnje.'[5] Tejlorizam ne objašnjava period ili fazu kapitalističke organizacije proizvodnje, već je on pre sam njegov kontinuitet, 'ako Tejlorizam danas ne postoji kao odvojena škola, to je zbog toga, nevezano za loš prizvuk imena, što on nije više vlasništvo frakcije, jer su njegova osnovna učenja postala kamen temeljac svakog dizajniranja rada.'[6] Za Bravermana, u jednom momentu u ranom dvadesetom veku, Tejlorizam je postao poopšten. Činjenica da su Tejlorove tehnike postale poznate u Nemačkoj jednostavno kao 'racionalizacija' može nam dati nekakav pojam o kontinuitetu sa kojim se on primenjivao sve do današnjih dana – na proces rada i organizaciju posla (i sasvim

opravdano se može dodati, čak i na neplaćeni rad) od akademskog posla, do posla serviranja u Pret A Manžeu, zadaci se mere, ekonomija inputa i autputa biva uspostavljena, kreiraju se mete i iste se šire, donošenje odluka je centralizovano, a troškovi su srezani. Štaviše, malobrojnost razumevanja i kritike Tejlorovih inovacija biva potvrđena kada Braverman diskutuje Lenjinovo entuzijastično usvajanje Tejlorovih tehnika. Uprkos opisivanju Tejlorizma 1914 te kao 'Porobljavanja čoveka od strane mašine', Vladimir Lenjin, kada su Boljševici došli u posed moći, izrazio je njegovo divljenje spram Tejlorovih sistema i zahtevao uvođenje njegovih tehnika radi rapidne industrijalizacije Sovjetskog Saveza.

« Mogućnost izgradnje socijalizma zavisi upravo od našeg uspeha u kombinovanju sovjetske moći i sovjetske administrativne organizacije, sa savremenim dostignućima kapitalizma. Mi u Rusiji moramo organizovati studije i izučavanje Tejlorovih sistema i sistematično pokušavati da ih adaptiramo u skladu sa našim ciljevima. »[8]

Produktivizam otelovljen od strane Tejlorističkog upravljanja bio je, po Rabinbahovim rečima, 'politički promiskuitetan'. Njegov tehnokratski idealizam našao je svoje pristalice duž čitavog političkog spektra tokom perioda za koji je bilo karakteristično, uprkos ogromnim razaranjima usled Prvog Svetskog Rata, verovanje u beskonačno širenje produktivnosti i 'ponovno unapređenje tehnologije'.

Vizija društva u kome će socijalni konflikti biti eliminisani u korist tehnoloških i naučnih imperativa može prigrliti 'liberalna, socijalistička, autoritarijanska, pa čak i komunistička, kao i fašistička rešenja'.[9]

Istorijski komentatori mogu odbaciti Lenjina i boljševizam kao inherentno autoritarijanske, ipak jasno je da misao tejlorizma i misao boljševizma, obe jednako dele autoritarijanske osobine, čak i u anarhističkoj Španiji 1930ih, anti-autoritarijanski elementi osećali su se 'naterani' da usvoje slične

mere. Može se diskutovati o prihvatanju, ili još gore, distanciranom divljenju, među Francuskom levicom pod popularnim frontom, i kasnije kod pro-višijevskih sindikalista i čak u anarhističkoj Španiji.[10]

**Uređaji otuđenja**

U Džejmsonovom razvijanju analogije sa monta žnom trakom; razdvajanje procesa, prodire čak do diskretnih jedinica proizvodnje, on citira dve ključne figure, Bertolda Brehta i Viktora Šklovskog. Svaki od njih, na različite načine, istraživao je razvoj opažanja i apercepcije (odnosno opažanja opažanja, za šta je Breht imao frazu 'pokazivanje treba biti pokazano') u umetnosti, formulišući ono što možemo nazvati homeopatskim odgovorima na otuđeno iskustvo pod kapitalizmom.

Poznato je kako je Breht formulisao set tehnika u teatru koje je podveo pod *Verfremdungseffekt.*\*[11] Iako najčešće poznat na engleskom kao *alienation effect (efekat otuđenja)* , *Verfremdung*  može biti preveden kao *alienation (otuđenje), detachment (odvajanje)* (što je izbor Džona Vileta (John Willett)), *distanciacion (odvajanje)* (na Francuskom), ili *estrangement effect (efekat postranjenja, efekat otuđenja).* Iako je *Entfremdung*  – otuđenje (u smislu u kome ga koriste Hegel i Marks)  dovoljno blizak Brehtu, tako da je taj termin jednom ili dva puta i sam upotrebio u smislu u kom su ga upotrebljavali i drugi, Breht je taj pojam najverovatnije izveo usva- janjem koncepta *ostranenie* uobičajeno korištenog od strane Rusa koje je Breht upoznao u Moskvi i Berlinu, (Sergeja Tretjakova i Sergeja Ajzenštajna)[12]. Pojam je bio razvijen od strane Ruskog formaliste Viktora Šklovskog. *Priem Ostrannenniya ili  ostrane- nie ili ostranit'*  (glagol) može biti prevedeno kao: *defamiliarisation (defamilijarizacija), estrangement (postranjenje, otuđenje), making strange (činjenje stranim), making it strange (činjenje toga stanim)*

ili prosto *making things strange (činjenje stvari stranim).*

Šklovski govori o *ostraneniu* kao o procesu ili delu koje podaruje 'stranost' objektu ili slici, 'sklanjajući' ga iz mreže konvencionalnih, formulastičnih, stereo- tipnih percepcija i lingvistričkih izraza (baziranih na takvim percepcijama).[13]

Najčistija formulacija ovog pojma data je u Šklovskovom eseju 'Umetnost kao uređaj':

[...] kako bismo vratili osećaj našim usnama, kako bismo osećali objekte, kako bismo napravili kamen kamenim, dato nam je oruđe umetnosti. Svrha um- etnosti, onda, jeste da nas vodi znanju stvari kroz organ viđenja umesto prepoznavanja. Pomoću 'postranjivanja' objekata i komplikovanja oblika, uređaj umetnosti čini opažanje dugim i 'radnim'. Proces opažanja u umetnosti ima sebi svojstvenu svrhu i treba da bude proširen do potpunosti.[14]

*Ostranenie* je neologizam, i to je bitno za mis- ao Šklovskog usled toga što bi, čak i za Ruse, to zahtevalo upravo onaj poseban trud imaginacije koji uređaj treba da izazove. Tradicija ruskog formalizma u kojoj je Šklovski radio, insistirala je na tome da literatura predstavlja hermetički sistem, koji sadrži svoju sopstvenu formalnu logiku i strogost koja će biti praćena i ponovno napravljena od strane svakog pisca u njegovom radu. '[...] ova dva jezika, to jest, poetski i praktični, ne podudaraju se.'[15] Pre nego što izražava nekakvo sopstvo, literatura i umetnost izražava samu sebe, svoje vladare, svoje slobode i neslobode (koje potom u sebe uvlače i transformišu određenosti spoljašnjeg sveta – života).[16] U opisu Šklovskog, umetnost je uređaj za činjenje bliskog dalekim, za usmeravanje 'automatskog' opažanja ka naročitosti objekata i odnosa. U tim sistemima sadržaj je jednostavno pretekst za ukorenjivanje habitualnih perspektiva kroz literarne uređaje. Štaviše, Šklovski i ruski formalisti razvili su kompleks višeperspektivnih medijacija u literaturi - pre nego

hilomorfistički sistem po kome je forma ispunjena sadržajem - preko kojih različiti uređaji mogu uticati jedni na druge i transformisati se. U tom smislu, formalisti su otkrili da konstitutivni elementi rečenice u literaturi — reči — zapravo nisu sačinjene od slogova već od zvuka. Zvuci mogu nositi značenje ali takođe i *trans-sense* jezik. Umetničke tehnike u literaturi mogu biti sačinjene od 'retoričkih figura, lingvističkih i leksičkih fakata, fonetskih i ritmičkih elemenata, i metoda kompozicije i konstrukcije radnje [...]' ali isto i *odsustvovanjem* jednog ili više od njih.[17] Slični pokreti tokom dvadesetog stoleća razvijali su takvo formalno bavljenje redukcijom, odvajanjem, i tako dalje: OULIPO, Letrizam, L A N G U A G E poezija i zvuk, i konkretna poezija, svaki od tih pokreta istraživao je razbijanje proze i poezije na manje nezavisne jedinice — očigledno jedan važan *ш*-model za Šklovskog i one koji su ga pratili jeste filmska montaža. Prema tome, upošljavanje logike automatizacije, praćeno kroz ono što Krojcer naziva 'kapitalistički *racio',* u umetnosti barem, postaje sredstvo za 'činjenje svega novim'.

Ako ispitamo opšte zakone opažanja, možemo videti da kako opažanje postaje habitualno, ono takođe postaje automatsko. Dakle, najzad, sve naše veštine i iskustva funkcionišu nesvesno — automatski. [...] Ono što objašnjava zakone našeg proznog govora sa svojim fragmentarnim frazama i polu-artikulisanim rečima, to je taj proces automatizacije."[18]

### Autonomizacija i finansijalizacija

Prateći Bravermana, Džejmson širi svoj koncept autonomizacije kako bi objasnio proces finansijalizacije i eksponencijalne ekspanzije finansijskog kapitala od 1970ih. Kroz finansije, kapital ne prolazi više kroz klasičnu jednačinu N-R-N' već umesto M prelazi direktno na M prim. Novac pravi novac. Frederik Džejmson:

Drugim rečima, bogatstvo se tranformiše u kapital po sebi; to je autonomizacija procesa akumulacije kapitala, koji određuje svoju sopstvenu logiku preko one logike proizvodnje i potrošnje dobara kao takvih, kao i preko pojedinačnog preduzetnika i pojedinačnog radnika.[19]

U finansijama automatizacija elokventno objašnjava višepolarni način na koji tržište traži nove vektore profita tretirajući investiranja i dugove kao materijal za višestrane opklade i kontra opklade, koje se ponavljaju ponovo i ponovo kako se trguje dobrima, kako ona bivaju obezbeđena i ponovo obezbeđena. Strma autonomizacija tih procesa može biti viđena i u pričama za zastrašivanje o visokoj učestalosti i automatskoj trgovini. Dobar deo trgovine sve je više automatizovan i događa se brzinom koja premašuje mogućnosti ljudske percepcije — ta cirkulacija kapitala je brža od ljudskog vremena — sa svim pretnjama koje idu uz nju.[20] Ovde je povratna sprega, između računarstva i upravljanja, vredna pomena. Čarls Bebidž izvršio je veliki uticaj na Tejlora — rani temelji računarstva informatički su podržavali razvoj intenzivnog upravljanja procesom rada — za uzvrat IBMov sistem bušenih kartica učinio je apstraktno radno vreme 'fizičkom realnošću' — tehnički objekat — bio je razvijen posle drugog svetskog rata kao model ranih računarskih sistema.[21]

### Kibernetika i gramatizacija

U tom kontekstu interesantno je skorašnje istraživanje Matea Paskvinelija (Matteo Pasquinelli) o radu Romana Alkvatija (Romano Alquati) o kibernetici (objavljenom u *Quaderni Rossi* u dva dela od 1962 do 1963). Alkvati je pokušao da izvede jednu od prvih marksističkih analiza kibernetike. Alkvati je video kibernetiku kao proširenje unutrašnje birokratije koje nadgleda proizvodni proces fabrike preko kontole informacija *(informazioni di controllo).*

Kibernetika globalno i organski rekomponuje funkcije opšteg radnika koje su razbijene u pojedinačne mikro-odluke: delić povezuje atomizovanog radnika sa ciframa plana.[22]

Štaviše, kako bismo skicirali drugi pol mogućeg daljeg istraživanja: povratna sprega, ukoliko pratimo skorašnje argumente Benedikta Simora (Benedict Seymour), može biti viđenja kao izvedeni oblik same vrednosne forme kao vrste 'Pra-forme povratne sprege' – samovrednujće vrednosti.[23] Proširenje, kroz koje ne samo kibernetika već takođe i farmakologija, tehnička obuka radnika i tekuće uklanjanja njihovih kapaciteta od njih i njihova zamena za mašine diskutovana je od strane Bernarda Štiglera (Bernard Stiegler) kao 'gramatizacija'.

Gramatizacija gesta, koja je bila baza onoga što je Karl Marks opisao kao proletarizaciju, to jest, gubitak *savoir-faire*, praćena je razvojem elektronskih i digitalnih uređaja do momenta u kome svi oblici znanja postaju gramatizovni preko saznajnih i kulturalnih mnemotehnologija. To će uključivati način na koji lingvističko znanje postaje tehnologija ili industrija automatskog procesuiranja jezika, ali to će takođe uključivati savoir-vivre, to jest, to ponašanje je opšte, od profilisanja korisnika do gramatizacije afekata – sve to vodi ka 'saznajnom' i 'kulturalnom' kapitalizmu hiperindustrijske ekonomije *usluga.*[24] Kroz ove uvide Štigler napreduje ka teoretskoj obnovi industrijskog društva baziranoj na napuštanju' kompleksa potrošnje', ali to je vođeno jednim suštinski tehničkim rešenjem koje ne potiče iz eksplozije protivrečnosti interni kapitalizmu, već pre ide ka razrešenju tih protivrečnosti kroz upravljanje njima.[25] Njegova kritika proletarizacije povezana je sa postepenim gubitkom znanja od strane radnika, ali radničko otuđenje – 'apsolutna beda' – nije jednostavno problem percepcije već aktualne materijalne dispozesije. Ta dispozesija je integralna sa vezom između kapitala i rada. Na višem nivou ona se ponavlja u visoko apstraktnim zdanjima finansijalizacije, taj proces dispozesije je reprodukovan na još većoj i globalnoj distanci, to je proces koji biva sproveden mašinama, ali to je takođe mašinski i samoproizvodeći odnos. To je pitanje znanja jednako na najjednostavnijem i najkompleksnijem nivou, ali za Marksa, to je pre svega prvo pitanje materijalne dispozesije (uključujući dispozesiju čulnog opažanja i znanja) na najjednostavnijem i najsloženijem nivou.

## Terminalna autonomizacija

Neki dodatni uvidi Žaka Kamatea, koji je diskutvao finansije u smislu autonomizacije još 1974, objašnjavaju: 'Autonomizaciju različitih proizvoda kapitala – profita, interesa i zemljišne rente.'[26]

Autonomizacija – koja je takođe 'begunac od kapitala', postaje pretnja, tendencija koja preti da negira osnovu kapitala u njegovoj akumulaciji – 'pitanje koje se ovde postavlja je sledeće, kako da znamo na koji način da povežemo različite autonomizovane pokrete koji su samoautonomizujući tako da se sve ne završi u disagregaciji celine.'[27] Kamate uokviruje autonomizaciju kao istorijski konzistentan proces kapitala: '[...] za Marksa svaki momenat kapitala postaje više ili manje autonomizovan kapital [...]'.[28] U liniji sa Kamateovim pogledom stoji skorašnji tekst dvojice brazilsih akademika, Tomas Nilsen Rota (Tomas Nielsen Rotta) i Rodrigo Alves Teikeira (Rodrigo Alves Teixeira), koji su pisali o finansijskoj krizi u SAD teoretizujući autonomizaciju na sledeći način:

Autonomizacija se odnosi na ontološku tendenciju kapitala da se deli i potkopava svoju sopstvenu materijalnu bazu širenja [...] Teorija autonomizacije u svom središtu ima razumevanje po kome ekspanzija vrednosti konstituiše kontradiktornu dinamiku, koja ima kako samounapređujuće, tako i

samonegirajuće efekte.[29] Kamate razumeva širenje finansijskog kapitala kao krajnju formu autonomizacije (novac oslobođen proizvodnje i novac koji umnožava sam sebe) koja izaziva sposobnost kapitala da prolazi kroz izvlačenje viška vrednosti – jedno bekstvo od zakona vrednosti – bivajući održiv samo preko 'antropomorfozisa' apsorpcije ukupnosti 'ljudske supstance' od strane kapitala: 'potpuni razvoj kapitala kao dovršene strukture, ili još bolje, materijalne zajednice, omogućava mu da izbegne tu fikciju zbog toga što je ona praćena fenomenom antropomorfozisa'.[30] Kapital koji postaje subjekat diskutovan je kod Marksa u pogledu mašinerije i u *Grundrisse* '[...] automatizacija sama po sebi jeste subjekat i radnici su tu samo organi, koordinisani sa nesvesnim organima automatizacije.'[31] Ipak, možda je idenje predaleko to predlagati kao 'konačno rešenje', pre nego kao fatalnu kontradikciju za kapital. Kapital i rad su povezani u integralnoj vezi i u određenom periodu možemo identifikovati sve izlazne tendencije kojima pokušavaju da pobegnu od posredovanja jednog sa drugim, što je praćeno mnogim problemima i krizama.'[32]

### Autonomizacija, oslobođenje i istorija

Kamate povezuje oslobođenje i autonomizaciju (predlažući da svaka faza autonomizacije, 'zatvaranja ljudskog bića deo po deo' ovde ima i korelativni pokret ka oslobođenju – ili autonomiji' jednu aktivnost slamanja pasivnosti i zavisnosti').[33]
Theorie Communiste (TC) to širi na socijalne pokrete: 'Kao za aktivizam, to je atonomizacija ovog ciklusa, sa svim neophodnim ideološkim formulacijama koje to uključuje.'[34] TC shvata sadašnju 'krizu odnosa nadnica' u smislu predskazanja pokretima da afirmišu radnički identitet unutar kapitalizma (radnički pokret) kao i bez njega kao socijalni pokreti ('drugi svet je moguć'). U koncepciji grupe, svaki

od tih oblika je oblik alter-autonomizacije. U svakoj se postavlja granica na tački mobilizacije (apstraktni čovek) 'individua' i afirmaciji države i u kapitau kao 'nezaobliaznom horizontu', to jest, svaka izvodi svoju autonomiju iz kapitala – pozitivnu opoziciju iz njegovog odnosa spram negativog odnosa.
Nestanak aktivizma koji naginje ka alternativama, i aktivizma uopšte, rezultat je razvoja trenutnih borbi u kojem proizvodnja klasnih pripadnosti jeste jedno eksterno ograničenje u samoj činjenici borbi proletatijata, u njihovom recipročnom impliciranju sa kapitalom, pre nego kao autonomizacija u opoziciji kapitalu.'[35]
To postavlja pitanje korelacije između kretanja kapitala ili faza autonomizacije i socijalnih pokreta koji predlažu oblike 'oslobađanja'. Na primer, kasne 1960te i 1970te mogu biti viđene jednako kao godine otpuštanja radnika iz fabrika, odbijanja posla, oblika autonomije, stvaranja novih subjektiviteta, i veličanstvenog poraza kroz impoziciju neoliberalizacije i okretanja ka oblicima finansija i usluga vezanih sa 'industrijama'. Jedna alternativa, bez uništenja kapitalizma i kapitalističke tehnologije tout court znači jedan alternativni razvoj kapitalizma.
Zatim, ovde imamo neke kontradikcije – kao suprotstavljeni tim 'alter-autonomizacijama', *oblici* klasne borbe i društvene organizacije koji prolaze kroz logiku autonomizacije (prepoznajući ono od čega se autonomizuju, ili ne uspevaju da se autonomizuju) mogu da se pojavljuju kao načini konfrontacije i pomeranja preko racionalizacije i samoširenja od strane kapitala. To nas navodi da umesto TCjevog 'pozitivnog protiv pozitivnog' ono što se može razviti jesu oblici 'duplo negativnog' (da iskoristimo jedno pitanje sa *Mjuta*). Postavljanje 'starih loših stvari' – ljudske vrste ne kao apstraktnog čoveka (individue) niti kao organskog jedinstva. Za Adorna, 'jedino odvajanje može da se postavi kao kontrateža odvajanju'.[36] Prema tome fokus pokreta koji bi

adresirao autonomizaciju kapitala ne bi uključivao razvijanje korektiviteta otuđenja već razvijanje daljeg otuđenja na takav način da može da se nosi sa sadašnjim stanjem stvari i natera samosvest u konflikt sa antropomorfizmom. Estetska kritika je kritika koja traži i stvara operativna odvajanja, kao forme 'mimezisa prekaljenih i otuđenih,' ona se konfrontira kapitalu u njegovom osnovnom principu racionalnosti, prolazeći kroz njih, ona ih time ipak pomera van potreba ciklusa proizvodnje.[37]

Teorija postranjenja Viktora Šklovskog i njegova putanja 'prividne predaje' može biti smeštena unutar supsumcije estetičih i ljudskih kapaciteta pod poopštavajuću tejlorističku logiku — jednako kulturalnu i produktivno orijentisanu — u post-rerevolucionarnoj Rusiji NEP ere. Šklovski kritikuje Džejmsona zbog nedostatka 'istorijskog' uvida. Ipak ovde možemo dodati, da kao Lukačevac, Džejmson ostaje izložen Mojše Postonesovom (Moishe Poston) kritikovanju Lukačevig slavljenja istorijskog procesa. U belešci iz *Vreme, Rad i Socijalna Dominacija,* Postone primećuje da ne možemo odvojiti 'istorijski proces' kao ne-kapitalistički. Radije, život pod kapitalom jeste okarakterisan kao 'istorijska dinamika van ljudske kontrole', pored tog procesa ne ostaje ništa. 'Istorijski proces kao takav ne može biti suprotstavljen kapitalizmu.'[38] Dok kapital pokušava da postavi jedinstvo, prazno homogeno vreme, pažnja na umetnička dela umesto toga zaoštrava naše poimanje pojedinačnog, fragmentarnog i nesvarljive heterogenosti: 'društvena realnost je učinjena strmom — ona je multitemporalna. Epohe koje postoje unutar tog toka ili se sudaraju ili mirno koegzistiraju.'[39]

**Formalizam i spoznaja**

Kako bilo, šta god formalizam tvrdio za istoricitet, nedavno je otkrivena, u reformi višeg i osnovnog obrazovanja u Velikoj Britaniji — *'formalna estetika* bihejvioralne psihologije' — problematična reformulacija i raspored formalističkih tehnologija radi proizvodnje automatskog subjekta prikladnog instrumentalnim potrebama kapitalizma u krizi.

Formalizam institucionalne psihologije na koji se on [Majkl Gov (Michael Gove)] indirektno oslanja, izražen je u njegovoj tvrdnji da maksimizacija učinaka 'učenja' može biti postignuta uspostavljanjem interesnog tipa koji nema ništa sa željama i preferencijama osobe kojoj je 'interes' pripisan. Može izgledati kako to upućuje na odvajanje ili 'autonomiju procesa učenja od ekonomskih poslova, ali nije nam potreban Georgij Plehanov da bismo videli kako u svetu u kome je većina ljudi naterana da obavlja posao prema kome oseća malo ili nimalo *ličnog* interesovanja, primat ekonomsih svrha je reafirmisan čak i kultivacijom tih oblika formalnih ili 'saznajnih' interesa za koje izgleda kao da su kontradiktorni sa njima.[40]

U ovoj novoj rekuperaciji formalizma, njegovog sporog oživljavanja preko bihejvioralne psihogije, sadržaj je snažno odvojen od 'interesa'. Tehnička teškoća izvođenja je vezana za njegove zapreke.

'Saznajni' interes može biti probuđen od strane različitih vrsta opstrukcija, praznina, i poteškoća, i naravno one najčešće moraju biti stvorene, kada jedan objekat treba da bude permanentno imprintovan u ljudski 'memorijski sistem'. Drugim rečima, 'učinci razumevanja i pamćenja uopšteno će porasti' onda kada se um suočava sa raznim vrstama prepreka i nesigurnosti za koje možemo očekivati da ih 'umetnost' uopšte, i narativna umetnost posebno, mogu indukovati. Umetnost je veliki maksimizator učinaka ljudskog pamćenja.

U 'saznajnom procesuiranju' uzročnih sekvenci, um će doživljavati više 'interesa' gde god bude imao potrebu da izvrši određenu količinu rada. Umetnička dela, govorni akti, ili didaktičke vežbe dovoljno su blagotvorne da dozvole primaocu da izvrši 'saznajno premošćavanje zaključaka' koje mu se uopšte može pokazati više 'interesantnim' nego izvođenje u kome su veze u uzročno posledičnom lancu već uspostavljene.[41]

### Akumulirana pažnja

Ostaje nejasno kako tačno možemo povezati ovu instrumentalnu upotrebu formalizma sa njegovim poreklom u onda neobrnutoj obazrivo čuvanoj nesvrsishodnoj svrsi pomoću koje estetska tehnika može učiniti 'percepciju dugom i 'radnom' ? Jasno je da nesvrsishodnost može lako iskliznuti iz koloseka sa svrhom i da sve što ne ubije kapital potpuno može biti iskorišteno od strane samog kapitala protiv toga što je prethodno bilo okrenuto protiv kapitala. Štaviše, možemo se još jednom vratiti Marksu kako bismo utvrdili da odnos između poteškoća i pažnje nema poreklo u estetici, već u samom radnom procesu:

Na kraju svakog radnog procesa, rezultat se pojavljuje iz onoga što je već bilo započeto od strane radnika na početku, jer je već postojalo idealno. Čovek ne samo da izaziva promenu oblika u materijalima koje dobija iz prirode; on takođe realizuje [verwirklicht] svoju sopstvenu svrhu u tim materijalima. I ta svrha koje je svestan, određuje  način njegove aktivnosti rigidnošću zakona, i on joj mora podrediti svoju volju. To podređivanje nije puki trenutni akt. Pored napora organa koji rade, svrsishodna volja je potrebna tokom čitavog trajanja rada. Što znači da je za to potrebna posebna pažnja. Što je manje radnik privučen prirodom posla i načinom na koji se taj posao obavlja, tim manje on uživa u njemu kao u slobodnoj igri njegovih sopstvenih fizičkih i mentalnih snaga, i njegova pažnja je više primorana da bude usmerena na posao.[42]

Šklovski je rekao 'Umetnost pretvara partikularnosti stvari u opažajnu formu.'[43] I 'Umetnost procesuira etiku i pogled na svet pisca i oslobađa ga njegove originalne tenzije. Stvari se menjaju kada se nađu u knjizi.'[44] Bitno je da ne izgubimo iz vida istorijski aspekt formalizma, po kome nisu samo 'stvari' defamilijarizovane, već i jezik, i zatim takođe literatura.[45] To je fundamentalna inovacija Šklovskog. Pre nego uspostavljanjem stablilnosti između literature i njenog objekta, ili kriticizma i njegovog objekta (literature), svrhe i objekti umesto toga postaju nestabilni, dinamični i poetični, naglašavajući da proces automatizma – automatske percepcije, habituacije – koji je sam po sebi dinamička invarijanta industrijske kulture, nalazi jednako dinamičnu silu  opozicije u umetnosti (i to je posebno tačno ukoliko mislimo o umetnosti, filmu, literaturi i muzici u isto vreme).

### Autopoesis i autonomizacija

Važno je da se zadrži u vidu više - perspektivistički aspekt formalizma, čime ne samo da su 'stvari' nepoznate, već i jezik i književnost, pa tako i sama kritika. U tom smislu, ona sadrži istinu - sadržaj koji Teodor Adorno pripisuje umetnosti, po kojoj "umetnost ima spoznajni sadržaj, iako je sadržaj koji ne može na bilo koji jednostavan način da se ekstrakuje u nizu predloga'.[46] Umetnost, za Adorna stoga zahteva pažnju na način na koji prevazilazi bilo formalizam ili relativizam, koji osporava podelu umetnosti i nauke. Feliks Gatari je u psihoanalizi razvio ovaj kognitivni aspekt umetnosti i njene blizine konceptima kao aspekta autonomizacije u radu, Šklovskovog savremenika, Mihaila Bahtina: Ideja o neopozivosti estetskog objekta i implicitno ideja autopoesisa, pedagogije, psihijatrije i generalno u socijalnoj oblasti

opustošenom kapitalističkom subjektivnošću.

Prema Bahtinu, u ovom pokretu ”potrošač“ na neki način postaje ko-stvaralac; estetski oblik postiže ovaj rezultat jedino kroz uređaj za izolacionu ili razdvojnu funkciju takve vrste da ekspresivni materijal postaje formalno kreativan. Sadržaj umetničkog dela se odvaja od svojih konotacija koje su koliko kognitivne toliko i estetske: "izolacija ili odvajanje se ne odnosi na materijal, ne na rad kao stvar, već na njen značaj, na njen sadržaj, koji je oslobođen od određene neophodne veze sa jedinstvom prirode i jedinstvom etičkog slučaja postojanja." Tako postoji izvesna vrsta fragmenta sadržaja koji "zaposeda autora" da izazove određeni način estetske artikulacije. U domenu poezije, da bi se odvojila, autonomisala, kulminirala, kreativna subjektivnost će težiti da iskoristi:

1. zvučnost reči, njen muzički aspekt;

2. njena materijalna značenja sa svojim nijansama i varijantama;

3. njene verbalne veze;

4. njene emocionalne, intonacijske i voljne aspekte;

5. osećaj verbalne aktivnosti u aktivnoj generaciji označavajućeg zvuka, uključujući motorne elemente artikulacije, gesta, mimike; osećaj pokreta u kojem je ceo organizam zapuhnut, zajedno sa aktivnošću i dušom reči u njihovom konkretnom jedinstvu. Upravo je ovaj poslednji aspekt, izjavljuje Bahtin, taj koji obuhvata sve ostale.[47]

## Zaključak: Konačno odvajanje

Prema Džejmsonu, u radu Šklovskog '[...] mi smo dovedeni do toga da shvatimo nesamerljivost reči sa iskustvom, sa načinima žive egzistencije ... segmenti događaja su fragmentirani do mere u kojoj beskonačna deljivost celokupnog ljudskog iskustva počinje da izgleda kao dokaziva činjenica.'[48] Naglasak na vremenu, deljivosti i neekvivalentnosti sugeriše estetiku i umetnost kao nepromenljivo kontrakretanje spram dinamičnosti kapitalizma. Dok je Džejmsonov uvid pola slavljenje otpora, a pola jadikovanje, on pokušava da postavi jedno nemoguće jedinstvo koje jednako može postavljati i prevazilaziti ukupnost kapitala - naglašavanje Šklovskog onog pojedinačnog i nesamerljivog sugeriše još bliži međuodnos umetnosti i života koji svaki za sebe ostaju odvojeni i jedino onda autonomni kada se nalaze u blizini jedno sa drugim. Kao takav, prepun upotrebne vrednosti izbačene iz svog uobičajenog konteksta, Šklovski sa svojom prozom (čak ironično i tokom njegove 'najproduktivnije' faze u njegovog rada za bioskop u Gaskinu) produžava i rigorozno brani nekorisnost u svakodnevnom životu.[49] Ne postoji trenutak, u njegovim teoretskim kao ni u proznim spisima, koji se gotovo uvek preklapaju, kada je Šklovski bilo šta drugo osim posvećen potrebama sadašnjosti, njegovog vremena, njegove epohe, koliko god kontrarna, ironična ili čak perverzna bila pozicija sa koje on odgovara njenim hitnostima. Estetska aktivnost odupire se totalnoj neslobodi kapitala svojim neuspevanjem da bude totalno slobodna — ona je vezana za ograničavajuću rigoroznost aleatornog traganja umetnosti, i prema tome oslobađa samu sebe gospodarenja i dominacije putem koje je kapitalizam postavio konkretni rad kao nosioca univarzalne zamenljivosti vrednosti. Naprosto ne postoji način da se umetnost unese u socijalne konfrontacije bez

njenog deformisanja ili instrumentalizovanja. A ipak, ukoliko društvena konfrontacija pokreće proces kao indiferentan spram vrednovanja vrednosti, jednako aleatoran kao što je to umetnost, jednako zabrinut da očuva razdvojenost ljudskog života od njegovog funkcionalnog uništenja kao radne snage, onda tu postoji mogućnost da društvene borbe stupe u savez sa interesima umetnosti, bez opasnosti da se uruše u poslednje, ili da se one uruše u njih.

1. U ovom tekstu preskočiću diskusiju o skorašnjoj upotrebi termina francuskog filozofa Žaka Ransijera (Jacques Rancière) i nekoliko engleskih teoretičara estetike: Stjuarta Martina (Stewart Martin) i Gejla Deja (Gail Day), ova specifičnije estetska diskusija će nažalost biti odgođena do sledeće prilike.

2. Nažalost ovde neću imati dovoljno prostora da potpuno predstavim kritiku termina 'postvarenje'od strane Džilijan Rouz (Gillian Rose), onako kako ga je analizirala u njenom tekstu 'Žalopojka Reifikaciji', koji nam može dati značajno ograničavanje aspekata koje Džejmson naglašava i koji bi mogli pomoći kako bi se ublažio izvesni očigledni romanticizam i 'vitalizam' ove i drugih diskutovanih pozicija. Gillian Rose, 'the Lament over Reification', u *The Melancholy Science*, London & Basingstoke: Macmillan Press, str.27-48.

3. Fredric Jameson, 'Culture and Finance Capital', u *Critical Inquiry,* vol. 24, no. 1 (Autumn 1997), str. 259.

4. Siegfried Kracauer, *The Mass Ornament*, Cambridge Mass. & London: Harvard University Press, 1995, str.78-79.

5. Harry Braverman, *Labor and Monopoly Capital*, New York, 1974,  str.86.

6. Ibid., str.87.

7. Vladimir I. Lenin, "The Taylor System—Man's Enslavement by the Machine", http://www.marxists.org/archive/lenin/works/1914/mar/13.htm poslednji put pristupljeno novembra 2012.

8. Vladimir I. Lenin, "The Immediate Tasks of the Soviet Government" (1918), *Collected Works,* vol. 27 (Moscow, 1965), p. 259. Quoted in Harry Braverman, *Labor and Monopoly Capital* (New York, 1974), pp. 8-9. See also Robert Linhart, *Lénine, Les Paysans, Taylor* (Paris, 2004). Available: http://archive.org/details/LenineLesPaysansTaylor poslednji put pristupljeno novembra 2012.

9. Anson Rabinbach, *The Human Motor: Energy, Fatigue and the Origins of Modernity* (New York, 1992), str.272.

10. See: Michael Seidman, *Workers Against Work: Labor in Paris and Barcelona during the Popular Fronts* (Berkeley, 1991), p.11; Anson Rabinbach, *The Human Motor: Energy, Fatigue and the Origins of Modernity* (New York, 1992), pp.272-275; Jacques Rancière, 'From Pelloutier to Hitler: trade unionism and collaboration' in *Staging the People: The Proletarian and His Double*, (Staging the People, Vol.I), London: Verso, 2011, str.169-170.

11. Za nešto širu diskusiju vidi: John Willett, Brecht in Context, London: Methuen, 1984 i Owen Hatherley, 'Who's afraid of the *Verfremdungseffekt?*' u Militant Modernism, London: Zero Books, 2008.

12. Ibid., str.220.

13. Iz prevodiočevog uvoda Benjamina Šera, Viktor Shklovsky, *Theory of Prose,* [Trans. Benjamin Sher], Illinois: Dalkey Archive, 2009, p.xix. *  Doslovni prevod ovog Brehtovog termina na srpski jezik glasio bi *efekat otuđenja*, ipak možda je jedno od najboljih rešenja na srpsko-hrvatskom, rešenje koje pedlaže Darko Suvin, koji ovaj Brehtov termin prevodi kao: *efekat začudnosti*, čime naglašava Brehtovu intenciju da tim pojmom označi proces činjenja onoga svakidašnjeg nama stranim i začuđujućim. U ovom prevodu, zbog mnoštva engleskih prevodilačkih rešenja i jednog francuskog koje autor navodi, nismo u mogućnosti da konzistentnije primenimo valjano prevodilačko rešenje na našem jeziku, stoga ovde u

prevodu ostaju ostavljeni engleski prevodi, a u zagradama pored njih dodata su moguća rešenja na našem jeziku.  Prim.prev.

14. Viktor Shklovsky, *Theory of Prose,* (trans. Benjamin Sher) Illinois: Dalkey Archive, 2009, str.6.

15. Ibid., p.4.

16. "Ja proučavam neslobode kao da je to skup gimnastičke opreme. [ ... ] Od suštinske je važnosti da se traže metode. Da biste pronašli način proučavanja nesloboda različitog tipa 'A kasnije:' Delo književnosti živi na materijalu. Don Kihot i Manji duguju svoje postojanje neslobodi. Nemoguće je isključiti određeni materijal; neophodnost stvara dela književnosti. Viktor Šklovski, "Treće Fabrika", str.40 - 41 i str.8 - 9.

17. Carla Benedetti, *The Empty Cage: Inquiry into the Mysterious Disappearance of the Author,* New York: Cornell University Press, 2005. str.117-118.

18. Viktor Shklovsky, 'Art as Device', op.cit., str.4-5.

19. Frederic Jameson, 'Culture and Finance Capital', str.259.

20. Ključni primer biće 'flash-crash' na Vol-Stritu, Maja 2010. Ova tema je opširno istražena u nedavnom izdanju *Mjut* magazina,  *Mute* Vol. 3, No. 4 - Slave to the Algorithm,   http://www.metamute.org/editorial/magazine/mute-vol.-3-no.-4-slave-to-algorithm  vidi: Inigo Wilkins and Bogdan Dragos, 'Destructive Destruction? An Ecological Study of High-Frequency Trading', http://www.metamute.org/editorial/articles/destructive-destruction-ecological-study-high-frequency-trading  and to-algorithm  vidi: Inigo Wilkins and Bogdan Dragos, 'Destructive Destruction? An Ecological Study of High-Frequency Trading', http://www.metamute.org/editorial/articles/destructive-destruction-ecological-study-high-frequency-trading  and  Alberto Toscano, 'Gaming the Plumbing: High-Frequency Trading and the Spaces of Capital', http://www.metamute.org/editorial/articles/gaming-plumbing-high-frequency-trading-and-spaces-capital pristupljeno januara 2012.

21. Poreklo bušenih kartica počinje sa njihovom upotrebom na osamnaestovekovnim tekstilnim razbojima, upotreba se širi tokom devetnaestog veka na sve vrste velikih mašina, i onda od početka dvadesetog veka kao osnovno sredstvo za unos podataka i skladištenje u obradi podataka. Vidi: http://en.wikipedia.org/wiki/Punched_card

22. Romano Alquati 1963, prev. Matteo Pasquinelli, citirano u Matteo Pasquinelli, 'Machinic Capitalism and Network Surplus Value: Towards a Political Economy of the Turing Machine', *neobjavljeno*. Skica, str. 6, http://bit.ly/nIjAVo

23. Benedict Seymour, 'Short Circuits: Finance, Feedback and Culture', *Mute*, vol.3  #1,  http://www.metamute.org/editorial/articles/short-circuits-finance-feedback-and-culture

24. Bernard Stiegler, *For a New Critique of Political Economy,* Cambridge: Polity Press, 2010, str.33.

25. Štiglerov konceptualni okvir je u mnogome ovistan o radu Žilberta Simondona i sledeći kritiku Simondona od strane Alberta Toskana može biti proširen na aspekte Štiglerovog rada u ovom polju, posebno njegov nedostatak kritičkog diskursa spram kapitalizma: 'Simondonova filozofija 'tehničke kulture' pokušava da neutrališe vezu između antagonizma i produktivizma koju on smatra za fatalnu platformu politika hladnog rata. [...] Simondonova istraživanja tehničkog objekta

moraju biti čitana kao jedan pokušaj da se izbegne diskurs kapitalizma i kritički diskurs u odnosu na kapitalizam, u svrhu mišljenja koje odbija paradigmu rada kako bi u tehničkoj i naučnoj aktivnosti pronalazaštva tražilo ključ nove geneze kolektivnoga života. [...] Postavimo to drugačije, i u terminima dragim jednako Marksu kao i Negriju, tretirajući podvođenje tehnologije pod kapital kao formalno pre nego realno ili ontološko, Simondon gubi uslove za mišljenje savremene konvergencije pronalaženja i rada, neprimetnost koja i dalje zahteva razumevanje sociogenetske funkcije eksploatacije. Drugim rečima, konfiguracija ontologije i politike ne može izbeći manir u kome 'realne apstrakcije' kapitalizma – novac, vrednost, apstraktni rad – kalupe samo biće mašina, pronalazaka i subjekata.' Alberto Toscano, 'The Disparate: Ontology, Politics, Simondon', Paper delivered at the Society for European Philosophy/Forum for European Philosophy annual conference, University of Sussex, 9 September 2007, http://www.after1968.org/app/webroot/uploads/Toscano_Ontology_Politics_Simondon.pdf

26. Jacques Camatte, *This World We Must Leave*, New York: Autonomedia, str.139.

27. Jacques Camatte, *This World We Must Leave*, op. cit., str.139.

28. Ibid., str.141.

29. Tomas Nielsen Rotta and Rodrigo Alves Teixeira, 'Marxian Theory of Financialisation of the U.S. Economy', http://www.sep.org.br/artigo/6_congresso/2510_399bd934f1de4cc35bdfe9be2404a9ce.pdf

30. Jacques Camatte, *This World We Must Leave*, New York: Autonomedia, str.139.

31. Karl Marx, *Capital,* Vol.1, (Trans. Ben Fowkes), London: Penguin, 1990, str.545.

32. 'Kapital sam po sebi jeste kontradikcija u pokretu, [u] tome on vrši pritisak kako bi radno vreme sveo na minimum, dok on postavlja radno vreme, s druge strane, kao jedinu meru i izvor bogatstva. Prema tome on umanjuje radno vreme u neophodnom obliku kako bi ga povećao u izlišnom; dakle on postavlja izlišnost u rastućoj meri kao stanje – pitanje života i smrti – kao neophodno. S jedne strane, onda, on poziva u život sve snage nauke i prirode, kao i one društvene kombinacije i društvenog opštenja, kako bi učinio stvaranje bogatstva nezavisnim (relativno) od radnog vremena koje je utrošeno na njega. S druge strane, želi da uzme radno vreme kao mernu jedinicu za džinovske socijalne sile time kreirane, i da ih smesti unutar granica neophodnih za održavanje već kreirane vrednosti kao vrednosti. Proizvodne snage i društveni odnosi – dve različite strane razvoja društvene individue – pojavljuju se za kapital kao puka sredstva, i jesu puka sredstva koja on koristi kako bi proizvodio na svojim ograničenim temeljima. Ustvari, svejedno, oni su materijalni uslovi za podizanje tog temelja u vazduh.' Karl Marx, *Grundrisse,* Penguin, London 1993, str.704–706.

33. Jacques Camatte, *This World We Must Leave,* op.cit., str.161.

34. Théorie Communiste (Roland Simon), 'The Present Moment', SIC: International Journal for Communisation, Issue 1, http://riff-raff.se/en/sic1/sic-1-07-the-present-moment.pdf  also  available  at  http://libcom.org/library/present-moment-theorie-communiste.

35. Ibid.

36. Theodor Adorno, *Aesthetic Theory,* str.54 (Athlone edition)

37. Theodor Adorno, Ibid, str.28.

38. Moishe Postone, *Time, Labour, Social Domination,* New York and Cambridge: Cambridge University Press, 1993, str.215.

39. Viktor Shklovsky, *The Energy of Delusion: a Book on Plot',* Illinois: Dalkey Archive, 2011, str.3.

40. Danny Hayward, 'Keeping Up With the Pavlovs', *Mute,* http://www.metamute.org/editorial/articles/keeping-pavlovs

41. Ibid.

42. Karl Marx, *Capital,* Tom.I, op.cit., str.284.

43. Viktor Shklovsky, 'Letter to Tynyanov', *Third Factory,* op.cit., str.xix.

44. Viktor Shklovsky, 'On the Freedom of Art' citirano u *Third Factory*, op.cit str. xviii.

45. Ova izvođenja u mnogome se oslanjaju na analize Karla Benedetija, *The Empty Cage: Inquiry into the Mysterious Disappearance of the Author*, op.cit., str.121-122.

46. Simon Jarvis, *Adorno: a Critical Introduction, Cambridge*: Polity Press, 1998, str.90.

47. Félix Guattari, 'On the Production of Subjectivity', u *Chaosmosis: An Ethico-Aesthetic Paradigm,* Bloomington, Indiana: Indiana University Press, 1995, str.14-15. Citati iz ovog pasusa su od Mikhail Bakhtin, 'Content, Material, and Form in Verbal Art', u  *Art and Answerability: Early Philosophical Essays by M.M.Baktin,* urednik Michael Hoquist i Vadim Liapunov, Austin: University of Texas Press, 1990, str.306-307.

48. Frederic Jameson, *The Prison-House of Language,* op.cit., str.77.

49. 'Kao prvo, ja imam posao u trećoj fabrici Gaskina. Kao drugo, ime nije teško objasniti. Prva fabrika bila je moja porodica i škola. Druga beše Opojaz. I treća – procesuira me upravo u sadašnjem trenutku.' Viktor Shklovsky, *Third Factory,* op.cit, str.8-9.

*Prevod sa engleskog: Lazar Atanasković*

# Zarazna Arhitektura:

# računanje, estetika i prostor[1]

**Kibernetska misao
(Poglavlje 3. Arhitektura misli)**

Godine 1968., za izložbu "Kibernetskih slučajnih otkrića" održanu na Institutu za Savremenu umetnost u Londonu sa kustosom Džesijom Rajhart (Jasia Reichardt), kibernetičar i arhitekta Gordon Pask izumeo je računarsku arhitekturu misli. Mnogo pre konstrukcije digitalnog kompjutera, Paskova interesovanja u kibernetici vodila su ga do istraživanja uloge povratne sprege u definisanju prostora misli, posebno se oslanjajući na kiberneticistički pogled da saznanje može biti shvaćeno kroz nervne strukture koje uče i prilagođavaju se sredini.[2]

Do kasnih 1950ih, Pask je izgradio nekoliko elektrohemijskih naprava koje su imale sposobnosti da upotrebe svoje sopstvene senzore i tako uspostave vezu između svojih unutrašnjih stanja i spoljašnjeg sveta. Te naprave bile su dizajnirane tako da razviju sve višu osetljivost na zvuk ili magnetna polja. Najpoznatija od mašina koje je konstruisao bila je *MusiColour* mašina: lajtšou koji je odgovarao na zvuk. Ta mašina bila je programirana tako da joj postane dosadno kada ne može reagovati na muziku koja se izvodila, time terajući muzičara da promeni kompoziciju ne bi li ponovo izazvao odgovor njenog sistema. Još važnije, *MusiColour* mašina anticipirala je teoriju enaktivizma, time što je ukazivala na to da je evolucija saznajnog sistema podrazumevala interakciju sa okruženjem. Međutim, Pask je verovao da se elementi interakcije i za biološke i za kognitivne sisteme, moraju uvećavati u velikim brojevima, kako bi mreže prilagođavanja velikih razmera (analogne i digitalne) mogle biti izgrađene putem interaktivnih povratnih sprega. Protiv arhitekturalnih koncepcija po kojima saznajni sistem izrasta iz fiksirane tačke gledišta, Paskov rad predlaže materijalno ugrađen set opažljivih odnosa koji se menjaju tokom vremena. U njegovom radu, arhitekture misli se pojavljuju kroz interakciju elemenata unutar sveta, pomoću

koje se vrše merenja, povlače razlike, i formiraju koncepti.

Za Paska, inteligentno ponašanje je veština i ne može se iscrpeti kroz računarsko programiranje. S obzirom na to da inteligencija ne može biti unapred postavljena - tj. da ona nije unutrašnja osobina glave niti mehaničke kutije, nego pre ono što proizilazi iz interakcija – Pask insistira na prioritetu fizičkih odnosa, jer su ovi definisani stepenima ograničenja i slobode. Drugim rečima, nije računanje, već su biofizičke i hemijske reakcije ono što može generisati arhitekturu misli s onu stranu svakog datog seta pravila. Po Pasku, međutim, ove interakcije takođe trebaju objasniti hijerarhiju ciljeva i akcija, koje on definiše kao objektivne interakcije, kao i P2P jezičke razmene, odnosno subjektivne interakcije. Konkretno, pravila interakcije deo su njegove „Konverzacione teorije," u kojoj on nabraja razloge zašto su principi slaganja, razumevanja, i svesnosti krucijalni za stvaranje interakcija kako između čoveka i čoveka, tako i između čoveka i kompjutera, kao i kompjutera i kompjutera. Daleko od *on/off* logike računanja, Pask poima interakciju kao konverzaciju koja zahteva uzajamne akcije, poput onih koje se izvode u plesu, gde se nudi prostor pokretima drugih tela. Paskov model već je predvideo da će nove platforme u budućnosti računarske tehnologije biti transfer informacija i strukture podataka. On nije bio zaokupljen unosom informacija u telo, već pre pokazivanjem kako su interaktivni kvaliteti: slaganja, razumevanja, i svesnosti, svojstva koja proizilaze iz datog okruženja.

Paskovi eksperimenti sa mehaničkim i elektromehaničkim sistemima takođe obezbeđuju konceptualni okvir za izgradnju responzivne arhitekture koja omogućava ljudima i medijima da koegzistiraju u uzajamno konstruktivnom odnosu.[3] Za Paska, arhitektura je kibernetski sistem koji može, poput mozga, da uči da se prilagođava i menja kroz kreativno opštenje između građevina i onih koji ih koriste. Adaptivna arhitektura koju on predlaže, ipak je i računarski entitet (analogno računanje) koji je sposoban da uči iz stanja u kojima se nalazi, poput *MusiColour* mašine, i može davati predloge za svoju sopstvenu reorganizaciju i reaktivaciju svojih prostornih kapaciteta. Ova kibernetska arhitektura, koja uključuje mogućnost konstruisanja strukture koja se može digitalno kontrolisati i koja može transformisati svoje upotrebne mogućnosti u skladu sa promenom okolnosti, može takođe biti shvaćena kao jedna vrsta „predviđajuće arhitekture" o kojoj sam diskutovala u prvom poglavlju. Međutim, uprkos stepenu do kog predviđa pojmove responzivnosti i učestvovanja koji danas karakterišu interaktivnu arhitekturu, ova koncepcija misleće građevine mora se razlikovati od dizajna inteligentnih okruženja. Uzmimo za primer MIT-jev projekat dizajniranja *Inteligentne sobe* iz 1990ih, primer arhitekture opremljene saznajnim kapacitetima koji mogu biti izjednačeni sa računarskim izvođenjem algoritama (kod kojih se spoznaja izjednačava sa akcijom)[4], Paskovi eksperimenti u adaptivnoj arhitekturi mogu biti viđeni takođe i kao takvi da upućuju na to da interakcije građevine sa njenim okruženjem prvenstveno vode do prostora koji misli. Ipak, projekat *Inteligentne sobe* upotrebljava neuroarhitekturalno razumevanje prostora, u kojoj računar glatko sprovodi automatizovane aktivnosti vođene interaktivnim algoritmima koji su dizajnirani tako da odgovaraju ili reaguju na okolinu u skladu sa *inputima* (npr. pokret izaziva paljenje i gašenje svetla, zvuk izaziva puštanje roletni itd.). Ovaj vid odgovora na input podrazumeva da razmišljanje o nekoj radnji i stvarna radnja mogu biti podvedeni ili sintetizovani pod jednu čulnomotornu radnju. Ukratko, jednostavno gašenje svetla pri izlasku iz sobe postaje automatski odgovor.[5] To je jedan momentalni vid interakcije, koji je primarno reaktivan jer podrazumeva

da okolina reaguje u isto vreme kada i osoba unutar nje.

Dizajn *Inteligentne sobe,* inspirisan je ranim kibernetičkim modelima, po kojima okolina može postati inteligentna, responzivna ili interaktivna, ili ukoliko je algoritamski programirana da čini određene radnje, ili zbog emergencije inteligentnog ponašanja usled neuroalgoritamskih veza. Nije iznenađujuće da interakcijom u ovom primeru upravlja izgradnja upravljajućih operatera, koji su na primer podešeni tako da optimizuju raspodelu sunčevog svetla tako da sobe mogu menjati boju dok ljudi ulaze u njih. Ipak, za Paska, ovakva vrsta idealne interakcije bi u sebe uključivala preprogramiranje okruženja na takav način da bi ona momentalno odgovarala ljudima, bez konačnog dopuštanja samo-organizacije arhitekture sposobne da uspostavi zaista dinamičnu konverzaciju sa svojim stanovnicima.

Takav dijalog zahtevao bi potpunu promenu organizacione strukture arhitekture. Pask shvata ulazni kriterijum kao skup fino podešenih promenljivih koje se menjaju u skladu sa potencijalnim okolnostima, i zbog toga ih ne vidi kao unapred postavljene varijacije ili verovatnoće interakcije koje mogu biti primenjene na ljude-mašine. Od celokupnog interaktivnog okruženja (ne samo od računara ili učesnika) odatle se zahteva da odabere i konstruiše svoje sopstvene ulazne kriterijume, svoje apstraktne objekte za potencijalno ostvarivanje. Sa Paskove tačke gledišta, samo onda kada je takvo interaktivno okruženje osmišljeno dinamično, može se reći da oni koji ga okupiraju ulaze u nove nivoe angažovanja, utoliko što postaju agenti evolucije mesta koje nastanjuju.

Odatle je jasno kako je Paskova arhitektura misli određena od strane interaktivne dinamike zasnovane na materijalnom svetu elektrohemijskih sklopova, stvaranju građevinskih veza i sklopova, i dizajniranju alata koje ljudi mogu koristiti kako bi konstruisali svoja sopstvena okruženja podataka.[6] Pask je stoga više nego pionir neuroarhitekture, jer njegova kibernetička arhitektura misli jasno prihvata kibernetiku drugog reda, tj. pojmove samoorganizacije, prilagođavanja, i kapaciteta za promenu strukturalnog aranžiranja prostora preko učenja pomoću povratne sprege sa okolinom. Sa tog stanovišta, njegova kibernetička arhitektura stoji odvojeno od matematičke vizije po kojoj je um sačinjen od a priori formalnih aksioma, i susreće se direktno sa okolinskom inteligencijom fizičkog, hemijskog i materijalnog sveta. Pask je stvorio niz arhitektura misli koje su bile namenjene tome da budu otvoreni prostori za učenje kroz interakciju,[7] bazirano na dinamičnoj konverzaciji između komunikacionih okruženja i njihovih stanovnika, u kojima ljudi i mašine mogu raditi zajedno kako bi formirali samo-proizlazeći sistem koji donosi saznanje. Drugim rečima, njegova kibernetička arhitektura izgleda bliža enaktivizmu nego neurosaznanju. S druge strane, uprkos njegovom angažovanju oko kibernetičkog vida računarske misli, centralnost pojma povratne sprege kao reverzibilnog odnosa između okruženja i građevine (odnos koji konačno vodi građevinu ka tome da se prilagođava, menja, i time misli kroz učenje) ne daje nam mnogo šansi da objasnimo o čemu se radi povodom predloga algoritamskog načina mišljenja.

Iako su Paskovi projekti uključivali u sebe nizove eksperimenata sa biološkim, hemijskim i mehaničkim načinima mišljenja, računarske dimenzije digitalnog prostora ostale su sekundarne, jer je izgledalo da taj prostor nije sposoban da se promeni bez spajanja sa spoljašnjom okolinom ili supstancijalnim supstratom. Ova tendencija ka otelovljenju misli ili ka njenoj ugradnji u okolinu takođe je evidentna u savremenim radovima koji su razvijeni ili inspirisani Paskovom zaostavštinom.

Na primer, na skorašnjoj izložbi „Pask Danas,"[8]

rad Ričarda Robertsa (Richard Roberts) *Slušanje Realnosti*[9] predložio je otelovljenu verziju konverzacije koja je bivala pokrenuta kretanjem ljudi oko akustične naprave. Ne samo da je Roberts pokazao kako postoji analogno računanje iskustva između ljudi i naprave: dodatno, taj projekat sugeriše, kako je to iskustvo dobijeno sistemom interakcija sposobnim da uči iz vlastitog okruženja. Ovaj projekat je time postao primer odigranog saznanja i ugrađene misli. S druge strane, projekti kao što je RKDov (Rodžersov kuhinjski dizajn) *Responzivni prostor* pokazuju kako okruženje prolazi kroz transformacije oblika kada je ono na to navedeno kretnjama posetilaca.[10] Ovde pojedinačni pokret direktno uobličava prostor. Na primer, takav pokret može uzrokovati da se sprat pomera 2,100mm više ili niže i premešta sa jedne strane na drugu, kako bi potpuno promenio oblik unutrašnjeg prostora. Senzori koji su rasuti u prostoru koji nastavlja da bude pokretljiv jer se njegov volumen neprestano menja usled različitih čulnomotornih odgovora, deluju kao katalizatori za transformaciju sobe. Može se činiti da je ova interaktivna arhitektura kontradiktorna stanovištima neuroarhitekture, utoliko što je prostor ovde aktiviran kroz čulnomotorne aktivnosti. Ipak, bitno je naglasiti kako ovaj projekat pokušava da pokaže da je oblik prostora, tj., računarsko okruženje, i samo u pokretu, i rekonfiguriše se svaki put od strane nerežiranog odigravanja. Pod od nerđajućeg čelika i zidovi opremljeni su nevidljivim senzorima koji su spremni da registruju čulnomotorne nadražaje i računaju prostor kroz neposredni odgovor. RKD, dakle, nudi model reakcija baziran na čulnomotornom odigravanju od strane prostora, gde unutrašnja forma sobe ostaje usklađena sa varijablama živih pokreta. Te kretnje izgleda da konstituišu kretanje saznanja kao čulnomotorne aktivacije nervnog prostora. Drugim rečima, kretanje saznanja ovde se razumeva kao ekvivalent čulnomotornim akcijama. Kao što

su Maturana i Varela zaključili, „saznanje je stvar interakcije na način na koji je neko sposoban da interaguje, ne procesuiranje onoga što je objektivno dato. Živi sistemi su saznajni sistemi i življenje je proces saznavanja.“[11]

Međutim, sa stanovišta neuroarhitekture, *Slušanje Realnosti i Responzivni Prostor* ne objašnjavaju kako ugrađeno računanje prostora modulira ili utiče na saznajno ponašanje. U isto vreme, neuroarhitektura takođe ne uspeva da objasni da prostor ne postoji pre iskustva, i da naglašavanje čulnomotornih prilagođavajućih odgovora od strane enaktivizma ukazuje na ko-konstituciju (interaktivno uparivanje) iskustva i prostora. Ipak, ono što i dalje nedostaje tim artikulacijama interaktivne spoznaje jeste to što su misli i dalje apstraktni objekti. To znači da su misli interno povezane i eksterno nepovezane, i prema tome uživaju prostorni raspored ili arhitekturu koji ne odgovara fizičkom rasporedu prostora. Ovi interaktivni projekti, prema tome, previđaju – u većoj meri nego Paskovi eksperimenti u hemijskom, biološkom i fizičkom računanju – smisao u kome su stvarni modaliteti informacija inficirani apstraktnim soničnim objektima, na primer, ili beskonačnostima opsega. Pojam saznajnog karaktera informacije korišćen u ovim projektima (za razliku od Paskovog) ne podrazumeva učeći ili rastući vid računanja koji potiče iz interaktivnih elemenata. Umesto toga, oni ostaju mnogo više doslovno identični fizičkim pokretima posetilaca. Kao posledica toga, interakcija između informacija i tela ovde je spojena u jedan sistem akcije i reakcije, dok god pokret tela ostaje ekvivalent informaciji. Biofizička dinamika tela u pokretu ovde jednostavno izvodi saznanje kao informaciju koja proizilazi iz čulnomotornih inputa. Nasuprot tome, Paskovo kibernetsko računanje pokazuje kako procesualno ili retroprocesualno učenje različitih elemenata arhitekturalne strukture može biti definisano kroz interakciju hemijskih, mehaničkih i fizičkih

elemenata čije vremenske i višeslojne ponavljajuće funkcije mogu usloviti pomaljanje spoznajne dinamike strukture. Sa tog stanovišta, Paskova kibernetska arhitektura shvata okolinu na sličan način kao enaktivizam, tj., kao konstituisanu od strane saznajne strukture misli, ali i kao takvu koja konstituiše tu strukturu. U sledećem odeljku ovo ekološko razumevanje spoznaje diskutovaću nešto opširnije, primećujući da Paskova kibernetska arhitektura nudi pogled na računanje koji ga uzima u obzir u smislu okruženja: kao informaciona podloga koja dopušta direktnu vezu između opažanja i spoznaje.

Pre nego što se okrenemo ekološkom razumevanju informacije, ovde još može biti bitno ukazivanje na to kako nam kibernetika, posebno Paskova artikulacija interakcije, može pomoći da stvorimo pojmove interaktivnosti koji se oslanjaju direktno na algoritamskom procesuiranju čulnomotornih odgovora. Drugim rečima, Paskov pojam interakcije značajno doprinosi razvoju teorije slučaja u računanju. Pošto su njegovi eksperimenti sa računanjem bili nešto bliže povezani sa biofizičkim i biohemijskim procesima računanja, takođe može izgledati kako oni imaju malo toga da dodaju pojmu meke misli koji ja ovde želim razviti. A ipak, ako se okrenemo ekološkom razumevanju informacije, možda će postati moguće razrešavanje ovog problema, jer ćemo biti vođeni prema mereotopološkom razumevanju informacije koji ne uključuje u sebe i to da jedan način računanja – jedan način mišljenja – može pod sebe supsumirati sve ostale.

**Ekološka misao**
**(Poglavlje 3. Arhitektura misli)**

Da bismo razumeli saznanje u terminima informacionog okruženja moramo se okrenuti Džejmsu J. Gibsonu koji argumentuje kako je informacija sama po sebi okruženje i ne samo jedan elemenat interakcije koji se treba dodati nekom drugom. Tokom 1970ih Gibson je razvio pojam informacije koji se odvojio od računarskog modela centriranog oko pravila, primećujući da informacija može jedino biti prikupljena, odabrana ili istražena iz okruženja, a ne preneta primaocu.[12] Informacija, prema tome, jeste okruženje koje je direktno opaženo: svet datosti koje su spremno dostupne za odabir. Zbog toga opažanje i saznanje, prema Gibsonu, objašnjavaju kako bivanje-u-svetu nema ništa sa mehanizmima inputa i autputa ili merom verovatnoća u komunicirajućem sistemu. Slično, znanje ne odgovara saznajnom stanju koje se generiše u glavi. Znanje je iskušavanje podataka koji nisu locirani u mozgu već u mišićima opažanja.[13]

Postavljanjem saznanja u okolinu, Gibson predlaže ekološki pristup misli. Taj pristup je pre svega doveo u pitanje pretpostavku po kojoj uslov za naše opažanje sveta jeste to da mi već moramo imati neke ideje o tom svetu. To znači da njegova teorija odbija pretpostavku po kojoj bismo bili sposobni da opažamo responzivnost samo ukoliko je ideja interaktivnog prostora već formirana u našim glavama. Protiv tog pogleda, Gibson objašnjava da nam jedino imerzivno opažanje okoline – i ne neke njene unapred date koncepcije – može dati stvarno znanje o prostoru. Kroz ekstrakciju apstraktnih invarijanata iz jednog informacionog toka ili kroz opažajni odabir podataka iz kontinuirane informacione pozadine moguće je, po Gibsonu, formirati znanje o kvalitetu objekata.[14]

Za Gibsona, saznanje je ovisno o pozadinskom okruženju koje je pregnantno informacijama. Ta pozadina ostaje u percepciji, iskustvu, i znanju čak i onda kada je van opažanja. Drugim rečima, apstraktna arhitektura jednog objekta iskušana je čak i onda, i posebno tada, kada ostaje neopažljiva, sklonjena iz sadašnje situacije, ili neodabrana od strane nekog stvarnog povoda. Na primer, da je

interaktivni svet *Slušanja realnosti* bio sposoban da izvuče nevidljive mogućnosti zvučnog prostora iz fizičkog pokreta, onda bi moglo biti da bi uslovi iskustva morali biti minuciozno sačinjeni tako da uključe u sebe mrtve uglove zvuka, nečujnih sjajnih objekata koji mogu afektivno prestupiti sve zvučne orijentacije. Samo uključujući takve ljudima nečujne realnosti zvučnih objekata, struktura iskustva može postati ne samo interaktivna već i imanentna informacionom okruženju u kome su smešteni opažanje i saznanje.

Nasuprot pristupu opažanja baziranom na osetima, po kome bilo šta van našeg vidokruga može biti jedino opaženo kroz sliku (tj., kad ga se sećamo, kad ga zamišljamo, ili kad ga smišljamo) ali ne direktno doživljeno, Gibson tvrdi da svaka zaklanjajuća ivica jeste umesto toga deo direktnog opažanja.[15] Neprovidne površine nisu nevidljive, već su opažene kao da su jedne iza drugih, ulazeći i izlazeći iz vidnog polja dok se posmatrač pomera u jednom pa u drugom smeru. Posebno, Gibson argumentuje da najkraći ili najduži interval kretanja (tj., kretanje koje traje samo delić sekunde, ili ono koje traje satima) razvija mogućnost opažanja nevidljivog kao takvog. On tu mogućnost naziva „povratnim zaklanjanjem," jer jedino pokret i njegova suprotnost mogu objasniti tu mogućnost.[16] Kao što tu postoji jedna podležuća invarijantna struktura, kontinuitet svih površina, razlika između skrivenog i raskrivenog može biti objašnjena kao kratka ili duga pauza u kretanju. Pojmljen takvim terminima, fizički pokret u *Slušanju realnosti* može na primer objasniti relaciju između čujnog i nečujnog kao dela jedne podležuće arhitekture zvučnih informacija, pre nego fokusiranje na stvarne zvučne prostore dizajnirane kako bi bili slušani od strane ljudskog uha.

Odatle je informaciona pozadina ovde topološka invarijanta same svetlosne energije, koja je izbila u prvi plan putem odabirne aktivnosti opažanja.

Drugim rečima, direktno opažanje nevidljivih objekata čini ih vidljivim. Međutim, računarska verzija ove pozadine u projektima kao što su *Responzivni prostor* izgleda da nedostaje, zato što volumetričke informacije uvek, već jesu, podudarne sa aktualnim i ne-potencijalnim pokretom. Onda se možemo zapitati kako interaktivni projekti kao što su *Responzivni prostor* zaista mogu u sebe uključivati topološki kontinuitet informacione pozadine. Može li to ujediniti sve površine koje omogućavajući izvornu percepciju (odabir i stvaranje) prostora informacija, ne bi li izvelo u prvi plan neočekivane varijable u iskustvu? Ne bi li zatvorena priroda programiranih odgovora ili računarska pozadina uvek već razgraničila čulnomotorno znanje o onome što bi moguće odgovaranje postalo?

Istinito je reći da Gibsonov ekološki pristup ima prednost deteritorijalizacije saznanja subjekta koji opaža, ali takođe i nervnu mrežu koja računarski sprovodi misao. Ovaj pristup zapravo objašnjava da je informacija okruženje, jedna uvek-iskušavana pozadina. A ipak, Gibson argumentuje da ta pozadina nije računarska. Ona je pre definisana kao neiscrpno kontinuirano energo-informaciono okruženje koje omogućava opažanje bivanja-u-svetu. To je isto što i reći da iako su informacije u pozadini, tj., unutar okruženja iz koga su pokupljene, tu uvek već jeste jedan opažajni entitet koji je ovde postavljen kao vršilac saznanja. Uprkos sugerisanju da znanje nije računanje i da je to sposobnost koju dopušta okruženje (izvođenjem odabranih informacija), Gibsonov ekološki pristup svejedno odbacuje ideju da postojanost informacione pozadine otkriva, s one strane direktnog čulnomotornog opažanja, iscrpljivanje te mogućnosti u stvarnim kombinacijama.

Argumentujući protiv stanovišta da kontinuirani tok mogućnosti – infinitezimalna beskonačnost topoloških invarijanti – konstituiše ontološku pozadinu aktualnosti, Vajthed umesto toga predlaže

da večni objekti (pozadinske mogućnosti) ne postoje kao jedna neprekinuta površina koja može biti direktno doživljena od strane tela čak i onda kada se nalazi van njegovog vidokruga, već su to diskretne beskonačnosti, spoljno nepovezane i negativno uhvaćene. Da to objasnimo na drugačiji način, kako sam diskutovala u drugom poglavlju, Vajthed predlaže mereotopološku matricu večnih objekata kako bi objasnio da su beskonačnosti diskretne dinamike, jer one nisu spojene jedna sa drugom kroz transcendentne principe. Dodatno, večni objekti takođe su diskontinuirano odabrani od strane stvarnih situacija, u kojima oni mogu postići realno zajedništvo ili jedinstvo kompleksnosti i kroz koje oni iscrpljuju njihovu diskretnu beskonačnost postajući jedno sa konačnim aktualnostima. Otuda iskustvo nije samo prednji plan kontinuirane informacione pozadine. Nasuprot, jer događaj iskustva zahteva da te diskretne beskonačnosti postanu određene dva puta: prvo prema (pozitivno i negativno) shvaćenim modalitetima ingresije u aktualnim situacijama, i drugo, prema novom zajedništvu koje oni počinju aktualno uživati kao odabrane mogućnosti. Slično, ne samo da pozadina mogućnosti postaje određena kada je odabrana od strane stvarnih situacija: ona je takođe određena prema beskonačnim nivoima unutrašnjih odnosa između beskonačnosti. Pozadina nije neiscrpna zaliha energije-informacija koje čekaju da budu realizovane u opažajnom iskustvu. Ta pozadina umesto toga pribavlja mereotopološku arhitekturu delova i celina koja ne može biti podvedena pod topološke invarijante ili a priori kontinuitet između inače diskretnih beskonačnosti. Ta pozadina prema tome jeste mereotopologija beskonačnih objekata, neostvarenih i neostvarljivih večnih objekata, koji su ipak imanentni iskustvu kao kontingentni načini mišljenja kojih ima mnogo. Drugim rečima, večni objekti su proživljene apstrakcije.[18] Ovde saznanje nije izvedeno iz fizičkog opažanja već je određeno konceptualnim shvatanjima spoljašnjih objekata. Posebno, saznanje razumljeno u tom smislu ne implicira čulnomotorne aktivnosti opažanja već pre odgovara konceptualnom ili nečulnom osećanju okarakterisanom kao „zabava neizraženih mogućnosti."[19] Da sumiramo: dok prihvatam Gibsonov pojam ekološke informacije, umesto njega sugerišem da je informaciona pozadina mereotopologija beskonačnih delova beskonačnosti, neračunljivih objekata, koji su imanentni i dalje određeni situacijama iskustva kao proživljene apstrakcije.

U isto vreme, diskontinuirani odnos između večnih objekata i stvarnih situacija se ukršta sa još jednim nivoom diskontinuiteta. Za algoritamska shvatanja ne može se reći da proizlaze iz fizički otelovljenih opažanja, a opet ni ne odgovaraju konačnim setovima podataka. Jedno algoritamsko konceptualno shvatanje je nefizičko i karakterisano kao „svest o onome što je bilo i o onome što može biti. To je zabava alternative."[20] Ukratko, ono što je problem sa ekološkim pristupom i njegovim autopoietičkim prizvukom jeste njegova tendencija da sabira informacije ili sa konačnim setom algoritama (zatvoreno računanje) ili sa pozadinom beskonačnih mogućnosti (celina kontinuiranih varijacija), bez objašnjenja kako informacije kao kvantifikacije mogu biti direktno poimane u smislu kvaliteta. Dodatno, ovaj antiračunarski pristup ne nudi nam mnogo mogućnosti za teorizaciju misli van teorije otelovljene spoznaje. Ovaj pristup će prema tome isključiti postojanje ili aktualnost računarskog načina mišljenja, jer računanje ovde ostaje definisano pojmovima konačnog seta verovatnoća, i to redukuje misao na statističke operacije. Protiv tog pogleda, predložiću da je aktuelnost meke misli jeste određena neračunljivim količinama koje su nepovratno inficirale „kalkulišuću" pozadinu iskustva. To je algoritamska zaraza sa beskonačnostima koja transformiše ove konačne setove podataka u dis-

kretne beskonačnosti i takođe razotkriva još jedan varijet beskonačnosti strukturi iskustva: nesintetizljivi kvantiteti koji odgovaraju smetnjama pre nego otelovljenju misli.

1. U publikaciji su uključena dva dela poglavlja 3. "Arhitektura misli", "Kibernetska misao" i "Ekološka misao" iz knjige Luciane Parisi "Zarazna Arhitektura_računanje, estetika, i prostor"

2. Warren S. McCulloch (Warren S. McCulloch) and Walter Pitts's (Walter Pitt) rad „A Logical Calculus of the Ideas Immanent in Nervous Activity" bio je pisan kako bi demonstrirao da program Turingove mašine može biti implementiran u konačnoj mreži formalnih neurona i da je zbog toga neuron (ili matematički apstrahovana nervna funkcija) doista osnovna logička jedinica mozga. Njihov veštački neuron (apstrahovan od neurofiziološke strukture mozga) dao je snažan doprinos razvoju teorije nervne mreže, ali još snažnije je doprineo razvoju kibernetičkog pogleda na računanje, koji je eventualno vodio do ideja samoorganizacije određene prilagođavanjem i učenjem. Ovaj rad prema tome otkriva da se uticaj kibernetike na računanje ne tiče simboličke manipulacije podacima, već arhitekturalnog oblika mozga. Vidi James A. Anderson (James A. Anderson) and Edward Rosenfeld (Edward Rosenfeld), eds., *Neurocomputing,* vol. 1, *Foundations of Research* (Cambridge, MA: MIT Press, 1989), 15 – 18. Paskovo eksperimentisanje sa kibernetskim mozgom dalje je doprinelo veštačkom razvoju bioloških neurona. MusiColour mašina, na primer, koristila je panele svetala kao biološke neurone, koji bi se aktivirali kada i ako autput pređe određeni prag vrednosti koji se menja tokom vremena. Vidi Pickering, *The Cybernetic Brain*, 316.

3. Vidi John Hamilton Frazer, "The Cybernetics of Architecture: A Tribute to the Contribution of Gordon Pask" (John Hamilton Frazer, " The Cybernetics of Architecture: A Tribute to the Contribution of Gordon Pask), *Kybernetes* 30, nos. 5 – 6 (2001), 641 – 651. Članak diskutuje Paskov doprinos razvoju ekološki responzivne arhitekturalne teorije.

4. R. A. Brooks (R. A. Brooks), M. Coen (M. Coen), D. Dang (D. Dang), J. DeBonet (J. DeBonet), J. Kramer (J. Kramer,), T. Lozano-P é rez (T. Lozano-P é rez), J. Mellor (J. Mellor), P. Pook (P. Pook), C. Stauffer (C. Stauffer), L. Stein (L. Stein), M. Torrance (M. Torrance), and M. Wessler (M. Wessler), "The Intelligent Room Project," Proceedings of the Second International Cognitive Conference (CT 1997), Aizu, Japan, Avgust 1997, dostupno na http://www.ai.mit.edu/projects/aire.orig/publications/ (poslednji put pristupljeno januara 2012).

5. O projektu MITa Inteligentna soba, vidi Michael Coen (Michael Coen), "The Future of Human-Computer Interaction or How I Learned to Stop Worrying and Love My Intelligent Room," *IEEE Intelligent Systems* (Mart-April 1999) dostupno na http://people.csail.mit.edu/mhcoen/Papers/stopworrying.pdf (poslednji put pristupljeno januara 2012).

6. Vidi Usman Haque (Usman Haque), "The Architectural Relevance of Gordon Pask," *Architectural Design* 77 ("The Architectural Relevance of Gordon Pask," Architectural Design), no. 4 (Jul-Avgust), 54-61. U tom kontekstu, krađa ili prisvajanje softvera, na primer, takođe se može shvatiti kao način razvoja alata za interakciju koja gradi nova informaciona okruženja kroz stvarnu konverzaciju između odvojenih softverskih struktura. O estetici interakcije kao ponovnog prisvajanja određenog softvera, vidi rad umetnika digitalnih medija Korija Arkangela (Cory Arcangel). Određenije, vidi projekte kao što su Infinite Fill Show, 2004. Vidi „Lekcije "Columbia Uni-versity Art and Technology Lectures," 16. Decembar 2006.

Dostupne na http://www.columbia.edu/itc/soa/dmc/cory_arcangel/ (poslednji put pristupljeno januara 2012).

7. Za detaljniju diskusiju Paskovih pionirskih pogleda interakcije vidi Peter Cariani, "Pask's Ear and Biological Creativity," (Peter Cariani, "Pask's Ear and Biological Creativity") dostupne na http://www.maverickmachines.com/WordPress/wpcontent/uploads/2007/07/petercariani.pdf (poslednji put pristupljeno januara 2012); Peter Cariani, "To Evolve an Ear: Epistemological Implications of Gordon Pask ' s Electrochemical Devices," *Systems Research* 10, no. 3 (1993), 19 – 33.

8. Ova izložba održana je u Ateljeu Farbergase, Beč, od 26. marta do 30. aprila 2008. godine. Detalji izložbe mogu se naći na http://paskpresent.com/exhibition/ (poslednji put pristupljeno januara 2012).

9. Robertsova instalacija sastoji se od dve čelične ploče koje su fizički povezane sa dva zvučnika, od kojih se jedna ponaša kao mikrofon, a druga kao drajver. Pojačalo i sistem nadzora stvaraju zvučnu povratnu spregu sa okruženjem. Kretanje ljudi oko naprave izaziva akustična svojstva prostora, koja se menjaju kroz različite oscilacije. Za detaljniji opis Slušanja realnosti, videti http://paskpresent.com/exhibition/?page_id=15 (poslednji put pristupljeno januara 2012).

10. RKDov projekakat Responzivni prostor bio je dizajniran za izložbu mašina u Galeriji Kelvingrov u Glasgovu, 1999. godine. Dokumentacija ovog projekta je dostupna na http://www.lucybullivant.net/html/showcase/publications/rogers.html (poslednji put pristupljeno juna 2012).

11. Humberto R. Maturana and Francisco J. Varela, *Autopoiesis and Cognition: The Realization of the Living* (Humberto R. Maturana and Francisco J. Varela, *Autopoiesis and Cognition: The Realization of the Living)* (Dordrecht: D. Reidel, 1980), str. 13.

12. James J. Gibson, *The Ecological Approach to Visual Perception* (James J. Gibson, *The Ecological Approach to Visual Perception*) (Boston: Houghton Mifflin, 1979), str. 243.

13. Saznanje može otpočeti jedino kao aktivnost opažanja, kao raspoređeno od strane tekućeg niza posmatrača koji hoda iz jednog vidika u drugi, pomera se oko objekta i time izvlači iz njega invarijante koje su podležuće promeni perspektive, otkrivajući veze između skrivenih i raskrivenih površina. Ibid., 303.

14. Gibson (James J. Gibson) je objasnio da ništa iz svetlosti nije kopirano u oko posmatrača, čak ni oblik stvari, njegova površina, njegova supstanca, boja ili pokret, ali sve te stvari su specifikovane u samom svetlu. Ibid., str. 305.

15. Gibsonov pojam dopustivosti podrazumeva određeni tip direktne percepcije. Na primer, slike nisu posredovane retinalnim, neuralnim ili mentalnim slikama. Direkto opažanje umesto toga dobija informacije iz okoline niza svetlosti. Direktno opažanje jeste rezultat istraživanja onoga što se nalazi oko stvari, vodeći pogled ka opažanju kontinuirane pozadinske površine. Ibid., str. 35.

16. Ibid., str. 202.

17. Ibid., str. 86.

18. Brajan Masumi (Brian Massumi) argumentuje kako pojam živuće apstrakcije objašnjava operacije stvarnog iskustva. Određenije, on ističe pojam tračka da bi objasnio kako događaji impliciraju iskustvo prolaznosti i kako ono što prolazi odgovara življenoj apstrakciji. Brian Massumi, *Semblance and Event: Activist Philosophy and the Occurrent Arts* (Cambridge, MA: MIT Press, 2011).

19. Whitehead, Modes of Thought, str. 26.

20. Ibid.

*Prevod sa engleskog: Lazar Atanasković*

# Haos u Mavau: Slučaj „Flash crash";
# ili forenzička reperformansa u dubinama vremena

Mora biti da imam nekakav opažaj svakog talasa sa obale utoliko što mogu sagledati ono što proističe iz kretanja svih talasa zajedno, naime moćni huk koji čujemo kraj mora.

—— Gotfrid Vilhelm Lajbnic (Gottfried Wilhelm Leibniz)[1]

**Automatizovani demoni**

Prvo pucaj, posle pitaj
—— Erik Hunsader (Eric Hunsader) [2]

Kada su 6. maja 2010. cene na finansijskom tržištu naglo opale i time izazvale opšte rasulo, berzanski indeksi poput Dau Džons industrijskog indeksa i Standard&Purovog500 (S&P500), pretrpeli su ogromne gubitke u rekordnom vremenu. Čak je i vrednost deonica pojedinačnih kompanija opala do prethodno nepoznatih nivoa, samo da bi se povratila nekoliko minuta kasnije.[3] Citiraću samo jednog od mnogih komentatora ovog bljeska globalne finansijske pandemije – prema njemu, taj događaj „ima odliku drugog najvećeg zamaha u iznosu od 1,010 poena, i najvećeg jednodnevnog pada u čitavoj 114-godišnjoj istoriji Dau Džons (Dow Jones) industrijskog indeksa, od 998,5 poena na dnevnoj osnovi."[4]

Pad koji je postao poznat kao „Flash Crash" dočekao je nespremne ne samo trgovce otvorenih pozicija nego je istovremeno pogodio i šire poslovne krugove. Primer toga je prenos na televiziji CNBC tokom kojeg su komentatori i voditelji TV emisije raspravljali uživo o finansijskoj pozadini žestokih protesta u Grčkoj i o tome kako su oni posledica kreditnog sloma i mera štednji. Iznenada, oni su počeli da usmeravaju pažnju sve više prema jednom drugom finansijskom događaju, događaju čiji ih je opseg zapanjio – neverovatni i neočekivati pad tržišnih cena koji im se odvijao ispred očiju.[5] Ne znajući šta je izazvalo taj pad – pošto se na osnovu ekonomskih podataka nije mogao uračunati tako nasilan udarac – okrenuli su se idiomatskim izrazima poput „kapitulacije".

Na ekranu je isprva bio snimak prenosa grčke pobune u Atini, izmešan sa ekonomskim podacima i prikazom tržišnih cena koje su proticale u zasebnom okviru na dnu ekrana (svakodnevna stvar i to ne

samo u današnjim poslovnim medijima). Međutim, prenos slike demonstranata koji se hvataju u koštac sa policijom polako je potamneo, a rasprava je odjednom poprimila novi ton i drugi sadržaj. Ekran je zableštao od tabela i dijagrama dok se razgovor polako pretvarao u emotivnu debatu o tome koji je to nepredviđeni događaj mogao izazvati toliko posrtanje transakcija. Spekulativna rešenja koja su pominjali uključivala su „slučaj masnog prsta" (štamparske greške), zastoj mašina (kvar na hardveru), nevolje sa softverom i hitnu prodaju deonica prouzrokovanu evropskom (te posebno grčkom) kreditnom krizom. Jedan komentator je čak počeo da ponavlja kako bi sada valjalo kupovati pošto su cene nekih deonica „smešno niske". Drugi je predložio politiku zastrašivanja i šokiranja kako bi se ekonomija ponovo pokrenula. Silovite globalne deformacije koje su uvele neoliberalne reformulacije i maksimalizacije ličnog interesa za profit postale su očigledne u ovom slučaju, odnosno, istovremenog prenosa građanskih nemira i finansijskog rata. Prenos grčke pobune i pada cena, uz prateću vizualnu i oralnu retoriku, igrom slučaja je otkrio jedan snažan kontrast. To je kontrast između kapitalističkog režima finansijalizacije[6] te dugom podstaknutog zatezanja politike i ekonomije s jedne strane, i efekta takvog režima na pojam javnog dobra s druge. Svetlo više nije bilo upereno na uništeni zajednički prostor u Grčkoj. Ono se sada uperilo ka istorijskom značaju algoritamskog kraha. U tom trenutku je postalo jasno da se iza ogromne tržišne neravnoteže krije katastrofalna greška još većeg obima. „Flash Crash" je zasenio i ostavio u senci ono što je postalo simbol uništenja agore, simbol uništenja same zajedničkosti, naime izbijanje javnog protesta na mestu njenog antičkog porekla u Atini.

Ispod radara agencija osnovanih da bi se pratila tržišna aktivnost, lični interes korporacija stvorio je još dublji nivo same inkorporacije: on je pro-

gramiran u „genetski" kod nove vrste finansijskih agencija, automatizovanih demona algoritamskog trgovanja.[7] Kao derivativi matematičkih modela, algoritmi su već izvršili revoluciju logističke infrastrukture razmene. Oni su to učinili tako što su izmestili berzanski prostor za trgovinu i time napustili ulogu trgovaca (ljudskih trgovaca poznatijih kao „lokalci") radi veće izvršne brzine. Ove demonske moći su potom oslobođene kako bi se direktno suočile jedne sa drugima, pregovarajući putem kompjuterizovanih mašina za uparivanje, čime su mogle da eksploatišu trgovinske mogućnosti pri brzinama koje su nedostižne njihovim ljudskim konkurentima. Temelji ovih radikalnih izmena udareni su tokom ranih sedamdesetih. Donald Mekenzi (Donald Mackenzie) nam govori kako je „finansijska ekonomija […] učinila mnogo više od analize tržišta. Ona ih je izmenila. Ona je predstavljala „mašinu", ali ne u smislu u kom ju je zamislio (Milton) Fridman: analiza je postala aktivna sila koja transformiše okolinu, a ne kamera koja je pasivno snima."[8] To nas podseća na jedno delo iz 1970ih, na radikalnu političku poemu Žil Skot-Herona (Gil Scott-Heron) pod nazivom *„The Revolution Will Not be Televised" („Revolucija se neće prikazivati),* objavljenu otprilike u isto vreme kada je čuvena Blek-Šolesova formula uvela algoritme koji su izazvali prvi derivativni talas neoliberalnih tržišnih revolucija koje se danas i dalje nadvijaju nad svetom. Ali dok se Mekenzijev opis tiče prevashodno „tela" i njihovih operacija, visokofrekventna trgovina (VFT) je u međuvremeno napustila ljudske trgovce radi kvantno-kodiranog algoritamskog trgovanja.

Vol Strit – kolateralna šteta i epitom teritorijalizovanog kapitalizma – postao je puki simbol. Dok je pretrpani prostor Njujorške berze (NB) još uvek neprikosnovena ikona „tržišta", njegovo prisustvo u medijima danas više zamagljuje nego što otkriva ono što je tržište zaista postalo. Ono se izmenilo na-

kon onoga što nazivam *kvantitativnim zaokretom* u finansijama. Od 2012., NB i njen prostor postala su vlasništvo Grupe „Interkontinentalna Razmena" (*Intercontinental Exchange*), snabdevača algoritamskih trgovinskih platformi iz Atlante, SAD.[9] Nekada nova i značajna arhitektonska čvorišta onoga što se pretvorilo u deteritorijalizovani informatički kapitalizam sada su neupadljivi i bezizražajni magacini, do vrha ispunjeni kompjuterskim serverima i optičkim vlaknima, u predgrađima oblasti poput Mavaa u Nju Džersiju.[10] Iako je 2010. ovo još uvek predstavljalo budućnost, nešto uznemirujuće je obuzelo tadašnje posmatrače čuvenog pada koji je postao poznat kao „Flash Crash": algoritmi demonskih moći, sada na mestu «vozača vozila» otrgnuli su se ljudskoj kontroli. Po prvi put u istoriji, botovi su napravili haos. Ne samo da je ovo uticalo na automatizovane trgovačke centre,[11] nego je ova „revolucija" zabljesnula svima ispred očiju u trenutku jednog globalnog prenosa.

**Forenzika bez forme**

Prošlost je samo nestrpljivost budućnosti.
—— Eli Ajaš[12]

Uprkos svim potencijalnim znakovima opasnosti, akutno posmatranje ipak nije bilo široko rasprostranjeno. Zajednička komisija dva regulatorna tela SAD-a, Komisija za trgovinu robnim fjučersima (KTRF) i Komisija za hartije od vrednosti (KHV), preduzeli su istraživanje[13] transakcione matrice ovog posebnog događaja: njihovi rezultati su dosta kritikovani kao nezadovoljavajući.[14] Ukratko, izveštaj zaključuje da je u pitanju bila ljudska greška i da je ona uz pojačanje kompjuterskih trgovinskih procedura bila ta koja je izazvala „Flash Crash". Izveštaj je krivicu za pad prebacio na nekog izvesnog trgovca uzajamnih fondova dugoročnih investitora.
U međuvremenu, manje citirano istraživanje što ga je sproveo jedan manji analitičar tržišnih podataka, Naneks, došao je do mnogo ubedljivijih rezultata. Ti rezultati su doveli u pitanje izveštaje KHV-a.[15] Naneks je svoju istraživačku metodologiju utemeljio na onome što bi se moglo nazvati forenzičkom arheologijom istorije trgovinskih podataka. Ovime je došao do zaključka koji za razliku od zvaničnog izveštaja nije nehotice usmeren[16] ka finansijskoj eliti zainteresovanoj za visokofrekventnu trgovinu (ili VFT — to je opšti izraz za trgovanje koje se zasniva na kompjuterskim algoritmima, a koje se odvija u mikrosekundama). Kao što ćemo videti ispod, Naneks je dokazao da je samo algoritamsko trgovanje to koje je izazvalo ovaj događaj i da je ono to učinilo bez ljudskog udela. Razlog zbog kojeg su ova dva izveštaja došla do tako različitih rezultata ne može se pripisati nedostatku materijala za istragu. Uspešan prilaz možemo pre pripisati dvoma ključnim faktorima. Prvi je kvalitet dubine istrage, ili tehnički rečeno, produkcija kvantitativnih kamera sa većom rezolucijom merenja vremena na skali ispod 1 sekunde unutar koje se odvija visokofrekventna trgovina. Sloj koji je trebalo istražiti bilo je takođe potrebno otkriti i istaknuti pre nego što se on naprosto razmotri i sagleda. Stoga, uređaji algoritamske analize bili su ključni za otkop arheoloških dokaza.[17] Njihova materijalna neuhvatljivost — koju ću ispod pripisati novoj vrsti mašina što izvrću apercepciju iz svesne percepcije(kada se mentalna pažnja uparuje sa prethodnim iskustvima i shvatanjima) u tehnološku spoznaju — krije gustu površinu od bezbroj podataka, površinu koja teži ka nevidljivosti i izvesnoj „protiv-percepciji" što olako izmiče spoznatljivosti. Ta činjenica označava drugi ključni aspekt analize, čin koji ju je isprva omogućio: otkrivanje vlasničkih trgovinskih podataka. Dole ću se pozivati na ovaj dvosmisleni ali ključni čin kao na čin manifestacije janusovskog lica stručnih svedoka u polju forenzike algoritamskog i automatizovanog trgovanja.

KHV i KTRF su svoj zvanični izveštaj zasnivali na materijalu omogućenom od strane učesnika u razmeni i tržištu, i on je pokazivao jednominutne intervale. Taj skup podataka bi možda bio dovoljan da se provere trgovačke aktivnosti pre napretka VFT-e. Ali danas, da citiram osnivača Naneksa, Erik Hunsadera, „za treptaj oka, tržište pređe put za koji je čoveku nekada bilo potrebno trideset minuta."[18] Uz VFT i „Flash Crash" – čije imenovanje podrazumeva novu kategoriju brzine – pregled materijalnog sastava kroz jednominutnu rezoluciju više skriva stvari nego što ih otkriva. Sledeći opis pokretanja Fejsbukove berze (IPO) dobro prikazuje razmeru njene veličine:

„Erik Hunsader: [...] NASDAQ je pokušao da načne IPO. Trećim pokušajem su već svima poručili da sačekaju, jer – *uhvatićemo ih u 11:05. Ne, neka bude ipak 11:10*. Ne, uhvatićemo ih sigurno u 11:30. Tako da je to bilo sada ili nikada. [...] Onda je nekome pala na pamet genijalna ideja da ponovo pokrene sistem. NASDAK-u je trebalo punih 17 sekundi dok se to desilo. [...] Kada se NASDAK ponovo pojavio, šta se onda desilo? Svi zahtevi koji su uknjiženi u to vreme odmah su nestali. Tokom tih 200 milisekundi nestalo je otprilike 60%-70% likvidnosti [...].

Kris Martenson (Chris Martenson): Dakle 17 sekundi mraka za jednu od najvećih berzi. To mora da je bio čitav životni vek ovih algoritama.

EH: Sedamnaest miliona mikrosekundi.

CM: Sedamnaest miliona mikrosekundi, to je čitava večnost.

EH: To jeste večnost i zato smo gledali kako su likvidnost i sve uknjižbe jednostavno – *nestale!*"[19]

Prema Hunsaderu, vremenska skala reda veličine mikrosekunde predstavlja opasnost po tržišnu aktivnost sama po sebi. U trenutku izazvan nedostatak likvidnosti – nestanak automatizovanog tržišnog poretka – je osnova sloma tržišta pošto „algoritmi vole predvidljivost. Ako ih nešto zaplaši (npr. neočekivana udarna vest; kašnjenje u otvaran-

ju tržišta), oni naprosto prestaju da trguju. [...] Bez pomoći i bez ponude, cene mogu pasti zastražujuće brzo. Još gore, 'pametniji' algosi [finansijski sleng za algoritme] mogu da prepoznaju proces posrtanja i da se potom okome natrag na kratku stranu tržišta, te da time samo pogoršaju pad cena."[20]

Ono što ovaj citat takođe pokazuje jeste suštinski besmisao istrage tržišne aktivnosti u okviru jednominutnih intervala. Zvaničnici zaduženi za osvetljavanje pozadine „Flash Crash"-a su stoga gledali u prikaz koji su pogrešno smatrali tačnim, nesvesni činjenice da je on bio nejasan i time beskorisan. Naneks je uspeo da izbegne zamku tako što nije poverovao veštačkoj matrici jednominutnih trgovinskih naloga. Erik Hunsader je potom komentarisao kako KHV/KTRF analitičari očigledno „od samog početka nisu imali skupove podataka na kojima bi radili. Oni su imali samo jednominutne podatke – na osnovu njih ne možete reći šta se desilo unutar tog minuta.". On dodaje kako ni njegovi vlastiti analitičari „nisu zapravo videli odnos između trgovanja i kvotnih stopa dok nisu zašli u oblast ispod jedne sekunde."[21]

## Reperformativna Forenzika

U stvarnim svetskim sistemima, ništa ne može biti manje normalno od normalnosti.

—— Endru Holdan i Benjamin Nelson, Banka Engleske.[22]

Naneks je firma za tržišna istraživanja koja obezbeđuje pravovremeni protok trgovinskih podataka i kvota za sve deonice Sjedinjenih Američkih Država, kao i za razmenu opcija i fjučersa [vrste finansijskih derivativa, *prim. prev.*]. Kao što im kaže internet stranica, „ove podatke smo pohranjivali od 2004. Stvorili smo i koristili brojne alate radi pregledanja ovog ogromnog skupa podataka: oko 2,5 tril-

iona kvoti i trgovanja od juna 2010.“[23] Drugde objavljuju da je „Naneksova baza podataka sada 20 puta veća od one koju ima NASA. Tako je – imamo više podataka o deonicama nego o celom svemiru.“[24] Sposobnost da se naprave algoritamske mašine koje dozvoljavanju obradu informacija tih razmera ključna je da bi se stekla rezolucija sposobna za prikaz – a time i razumevanje – trgovanja i kvote čije se sprovođenje odvija ispod praga ljudskog čulnog opažaja.

Ipak, Naneks nije smatrao ove podatke dovoljnim da bi se objasnio „Flash Crash“, zbog toga što ih nisu mogli uporediti sa svojim izvorima. Što se tiče bivšeg VFT trgovca, Dejvid Lauea, on je primetio sledeće: Tržišta i njihova međuigra sa svim tim preduzećima u industriji, uz svu zbrku i složenost tehnoloških sistema i načina na koji oni međusobno sudeluju, čine čitav sistem razmene, visokofrekventnosti, brokera i spoja različitih tehnologija, jednom vrlo složenom celinom... [...] Ovde nema ni uzroka ni posledice na koje biste mogli da se pozovete. Šta je izazvalo „Flash Crash“? To je besmisleno pitanje. [...] Čak i da opet pokrenete savršeno isti splet događaja, to nimalo ne garantuje da ćete opet izazvati „Flash Crash“. Takva je priroda složenih sistema.[25]

Sledeći korak otuda je bila primena drukčije strategije, ili bolje rečeno, širi prilaz. Nezadovoljni zvaničnim izveštajem, Naneks je sproveo ne samo istragu činjenica, nego i *istragu istrage*: zamolili su grupu koju je zvanični izveštaj krivio (iako ne i identifikovao), zajednički fond Vadel&Rid, da im omogući pristup trgovinskim podacima. U skladu s kapitalističkim režimom vlasništva, sasvim je moguće da bi taj fond odbio njihov zahtev, da su im ga uputili pre nego što su ovi bili okrivljeni. No, u vreme kada su analitičari Naneksa sprovodili svoju istragu, Vadel&Ridu je bilo u interesu da skinu ljagu sa imena, tako da su bili spremni da otkriju svoje trgovinske podatke iz vremena „Flash Crash“-a.

Dakle, uključivanje „izvornog koda“ vlasničkog skupa podataka dozvolilo je Naneksu da te podatke klasifikuje i da pruži objašnjenje stvarnih događaja koji su se dogodili u okviru mikro vremena.[26]

Njihova analiza oslanja se na aparat koji spaja sledeća tri kvantitativna okvira u pokušaju da obezbedi dovoljno približnu sliku trgovinskih postupaka: prvo, Naneksova ogromna i sve veća arhiva finansijskih podataka; drugo, prilagodljiva kvantitativna rezolucija njihovih sprava dopušta im istraživanje tih skupova podataka; i na kraju, podaci algoritamske trgovine jednog od vlasnika i učesnika. Ovaj okvir im je omogućio da razviju glavni narativ koji je naknadno izneo na videlo kibernetski režim VFT-a. Upotrebljujući jezični izraz koji se često koristi u računarstvu, ekonometriji i kvantitativnim finansijama, možemo opisati taj proces kao *parsiranje* odnosno kao raščlanjivanje naknadne analize trgovinskih performansi (dakle, vlasničkog skupa podataka Vadel & Rida) na performativne kamere koje ne samo što analiziraju, nego u trenutku stvaraju narativni prikaz (analiza postignuta Naneksom).

Konačna predstava događaja sastojala se iz obilja slikovitih simulacija koje su tu bile radi preglednijeg prikaza stvari koje su se desile tokom tih mikrosekundi. Ova tehno-estetika ide nasuprot ikonoklastičkom usmerenju kvantitativno-informacijskim znakovnim mašinama koje ne obavljaju komunikaciju sa ljudima. Senzori za vizuelno poboljšanje koji omogućavaju da se primete mutni vremenski tragovi i označe razlike unutar toliko složenog okruženja pružaju informacije koje se moraju na izvestnom stupnju „svariti“ da bi se uzdigle na površinu vidljivosti i shvatljivih predstava. Stoga, forenzička analiza niti je u potpunosti otelovljena u apstraktnim predstavama toka podataka niti je njima određena. Nasuprot tome, metodologija kojom se analiza sprovodi smeštena je – odnosno ugrađena – između spoja performansi u vidu samih događaja

što se odvijaju u tom trenutku (oličenih u „Flash Crash"-u) i predstave u smislu pružanja njihovog „vidljivog zaloga" ili performativne re-animacije njihovog izvorno nejasnog prisustva. Na osnovu toga sada možemo povući jasnije razlike u onome što se desilo unutar dokumentacijskih i vrednosnih aparata. Veštački čulni organi prodiru u dubine vremena tako što povećavaju rezoluciju protoka da bi dospeli do inače nadčulnog „mesta zločina". Forenzička analiza stoga predstavlja zamršeni i opsežni kibernetski poduhvat. Njega odlikuju postupci ponovnog mapiranja, modelovanja, zamišljanja i predstavljanja jedne naročite prošlosti, prošlosti koja se odigrala skoro brzinom svetlosti – odnosno izvođenje *ex post* onoga što je *izazvalo* budući događaj. Pošto takav prilaz ponovo izvodi *performansu* događaja, njegova metodologija se može odrediti kao *reperformansa*. Tehnološki, računski aspekt razdvajanja podataka dok oni ne iznedre dokaze – izvođenje reperfomanse – postaje jasan tek kada se sagleda sušta veličina materijala koji je Naneks ispitao:

6. maja je postojalo skoro 7,6 milijardi [...] zapisa. Stvorili smo oko 4500 skupova podataka i preko 1200 tabela pre nego što smo došli do onoga što verujemo da je izazvalo nagli pad od 600 bodova, sa početkom na 14:42:46 i krajem na 14:47:02. Stvarajući te skupove podataka razvili smo nekoliko vlastitih aplikacija koje pravovremeno prikazuju trenutne uslove i koje se mogu iskoristiti radi istorijske analize.[27]

Dok osnovni slojevi zone katastrofe za koje su okrivljeni ljudi nisu pokazivali ništa bitno, jedino je rigorozna istraga dubinskih, manje vidljivih slojeva mikroskopskog vremena bila ta koja je otkrila pravu matricu. Ono što je otuda proisteklo jeste „iskopina" čija vrednost je u svojevrsnom obrtu između prostora i vremena: dok uobičajeni pojam arheologije podrazumeva oprezan ulazak u konkretan i pozamašan prostor (kada recimo upotrebljavamo

tehnike poput premeravanja, prodiranja i recimo klasifikacije) da bi se izvukli materijalni svedoci prethodnog doba, forenzička arheologija finansija prodire u nevidljivu materijalnost vremena da bi otkrila obrasce i izvukla izrađevine čije se postojanje izvodi iz finansijskih modela i temelji na tehnologijama minijaturizacije, automatizacije i infrastrukture određene politikama sigurnosti, isključivanja i zatvaranja. Priča „Flash Crash"-a se odvija u neverovatno opširnoj oblasti protoka trgovinske razmene u kojoj postaje očigledno da tehnološki režim uključivanja/isključivanja jasno daje prvenstvo algoritamskom „aestetičnom modusu mišljenja"[28] male ali nadmoćne elite VFT trgovaca ili radije VFT kvanta. U pokušaju da prikaže složenu pozadinu tog pada, Naneks se poslužio metaforom: „KHV-ov izveštaj koristi se analogijom igre vrućeg krompira. Mi verujemo da je prikladniji opis igra između dve vatre u kojoj učestvuje gomila prvaka i nešto malo osmaka. Kada su se osmaci domogli lopte, svi ostali su pobegli iz panike i straha."[29]

**Likvidacija likvidnosti**

Sranje se dešava pa se dešava, nisam ja kriv.
—— Suhail Malik[30]

S tim na umu, nije iznenađujuće što sociolozi finansija, poput Daniela Beunze iz Londonske ekonomske škole, govore o „Flash Crash"-u kao o prekretnici u istoriji tržišta. Zvanični narativ do danas nije našao za shodno da napusti uobičajeno žrtveno jagnje – ljudski faktor, pre svega zbog oklevanja da se okrive one tehnologije i infrastrukture u koje su uložene ogromne investicije u proteklih nekoliko godina, uključujući visokotehnološki kvantitativni inženjering, mreže optičkih vlakana i sistema za obradu podataka, kao i bezbednosne infrastrukture (globalnu mrežnu arhitekturu finansijskih tržišta u re-

alnom vremenu).[31] Ipak prava analiza „Flash Crash"-a pokazuje sasvim drukčiju sliku, u kojoj za nasilje očigledno nisu krivi ni ljudi niti sudelovanje između ljudi i robota (što naglašava zvanični izveštaj), nego čitav opseg sudelovanja između samih robota materijalizovanih u okviru trgovinskih kvota. U doba algoritamskog trgovanja, razlika između kvota (ponude ili uloga) i prave trgovine (kada ulog i ponuda odgovaraju jedno drugom i kada se na osnovu njih odredi cena) je ključna pošto u poređenju sa kvotama samo mali deo tržišta zaista trguje. Naneksove procene kazuju priču u celini: više od 70 odsto razmene potiče od algoritama; ali razmenske kvote nadilaze ovu brojku u toj meri da pojam kapitulacija dobija novo značenje – 99,9%. Ove brojke dokazuju da je neki bot gotovo uvek već prisutan u toku transakcije.

Stoga, algoritamsko trgovanje pospešuje likvidnost tržišta[33], kao što večito ponavljaju oni koji zagovaraju VFT.[34] Ironija je pak u tome što su oni mnogo više u pravu nego što misle – algoritamsko trgovanje jeste likvidacija tržišta. Jasan zaključak je da su trgovačke mašine preuzele stvar. Velike investicijske strategije se sve više okreću od ljudske odluke ka mašinskim odlukama. Vilkins i Dragos tvrde da „algoritmi više nisu puka oruđa, nego učestvuju u analiziranju privrednih podataka, pretvaraju ih u relevantne informacije i ispostavljaju naloge za trgovanje.[35] Oni proračunavaju verovatnoću i donose odluke o strategijama ulaska ili izlaska [iz trgovine] koliko i načina na koji će se ona odvijati. Takvim algoritmima nekakav *događaj* (recimo loš privredni izveštaj, politički incident, itd.) može olako stati na put i za tren iscrpeti iz tržišta svu likvidnost, kao što se desilo sa Fejsbukovim IPO-m.[36] Koji bi se ljudski takmac na nekom od preostalih trgovačkih ureda usudio da dovede u pitanje botove koji rade na ravni mikrosekunde i činjenicu da se „desilo sranje" – da su kvote botova nestale u trenu ili da je strategija botova nagnala ogromnu količinu drugih botova da još više ubrzaju događaj? Zbog same te brzine tržišni forum je napušten za tren oka (po ljudskim standardima) kada se „Flash Crash" (u algoritamskim standardima) desio.

Dokaz do kojeg je je došla Naneksova primena obrade forenzičkih podataka kakva se retko viđa u okviru finansijskih tržišta otkriva da trgovačke tehnologije i procedure danas oblikuju tržište do te mere da ga zvanična regulatorna tela ne mogu dokučiti ni intelektualno ni politički.[37] Te činjenice upućuju na tačku (trans)akcije koja ne samo da prevazilazi sposobnosti ljudskog trgovačkog i regulatornog nadzora: nesposobnost upravljanja – tehnološkog koliko intelektualnog – očigledno ostavlja posledice na političke poluge rukovodioca pa samim time i onih koji ih podržavaju. Tim gore što je reč o polju u kojem svedok postaje nebitan budući da se procesi odvijaju van kognitivnih mogućnosti ljudskog mozga.[38] Na mestu zločina nema nikoga, niko ne može posmatrati šta se dešava. Kao što je rekao jedan komentator, citirajući trgovca i autora Sala Arnuka: „Nije reč o tome da ljudi sve manje i manje učestvuju u trgovini – oni u njoj ne mogu učestvovati uopšte. Dok neki običan investitor ugleda neku kvotu, vreme je već proteklo. To je kao da posmatrate zvezdu koja je sagorela pre 50 000 godina."[39]

Iz imaginarne perspektive algoritama (ili algosa), ljudi žive u nazadnom delu galaksije. Iz ljudske perspektive, algosi se nalaze daleko izvan svakog dosega, a daljinac kojim bi se mogli upravljati, izgubljen je usred ludnice deregulacije, političkih zastoja i „neracionalnog bogatstva" za vreme ekonomskog rasta.[40] Ovi propusti nisu štetni samo u ekonomskom smislu. Oni guše sposobnost odlučivanja putem političkog neslaganja, debate i kontrole (nalaženja daljinca takoreći) budući da uvek već prosleđuju političke i pravne poteze do te mere da one post-

aju ne-transparentni obzirom na pravila poslovanja. „Likvidnost", koja je toliko ključna za vođenje politike – dostupnost svih informacija potrebnih radi ispravnog odlučivanja – se sama likvidira. Javni forum koji je trebalo da iznese dokaze nakon istrage pretrpeo je poraz, dok za forenzičku analizu dostojnu obrade tih dokaza jedva da se čulo.

**Algoritamska apercepcija**

Svaka svest je stvar praga.
— Žil Delez[41]

Priče koje kruže oko „Flash Crash"-a i sa njime povezanim istragama pokazuju do koje se mere forenzika finansijskih tržišta već suočava sa teškoćama u toku prikupljanja izjava svedoka. Doći u posed podataka iz crnih kutija vlasništva trgovačkih preduzeća je već čuveno po svojoj teškoći.[42] Štaviše, istrage se retko izvode pred pravna tela, pošto se suočavaju sa preprekama još na nivou upravljanja mrežom. Detaljna istraga ovog slučaja – poduhvat koji prevazilazi okvire ovog članka – mogla bi pokazati da ovo nije samo puko pitanje tehnike nego da on ima čvrste veze sa interesima inkorporiranih strana.[43]

Zauzevši stanovište ekološke ekonomije, Vilkins i Dragos su dotakli pitanje na sledeći način:

Na dnu se nalaze osnovne vrste – robovi, kmetovi, proleteri, besplatan rad, potrošači, vlasnici naloga, itd. Ovim slojem se hrane oni koji su na lestvici više u lancu ishrane – penzijski fondovi, osiguravajuća društva, zajednički fondovi, manje banke; oni su zauzvrat hrana većim finansijskim institucijama poput hedž fondova, brokera, investicijskih banaka, VFT-ova za vlasničko trgovanje, itd. Svaki finansijski akter eksploatiše neefikasnosti svog plena i u toku toga stvara nove neefikasnosti, time dodatno pojačavajući informacijski nagib. Unutar tog ekološkog kompleksa postepeno se ustaljuju odno-

si grabljivice i plena, ali za razliku od pravog ekosistema, finansijski sistem ima mnogo veću stopu promene, što vodi ka tome da se sve veći prekidi u vidu događaja poput „Flash Crash"-a odvijaju po ubrzanom koraku jedne isprekidane ravnoteže, uz mnoštvo crnih labudova i masovnih izumiranja.[44]

Algoritamski botovi nude kvote u mikrosekundama. Ali kvota je samo ponuda za prodaju ili kupovinu, ona nije transakcija. S jedne strane, kao što je pomenuto, kvote omogućavaju likvidnost transakcijama („uvek" će postojati kvota koja odgovara vašem zahtevu i stoga jemči transakciju i cenu). S druge strane, ove mašine na mestima razmene zasipaju ogromne količine kvota. Kvote se često postavljaju bez namere da se izvrše. U tom slučaju, njihov cilj nije da olakšaju transakciju, odn. da trguju; pre će biti da, poput skrivenog svetla u „mračnom vremenu" izvan ljudskog opažaja, oni vrebaju neefikasnosti u velikom bloku zahteva koje sprovode institucionalni investitori kako bi doradili svoje velike portfolije.[45]

Nema sumnje da bi se tako agresivni postupci smatrali kriminalom ukoliko bismo ih preveli na ljudsko ponašanje. Ali najmlađi soj finansijskih demona se obzirom na to prilagodio tim specijalnim dopustima. Kao što kaže Džeri Adler (Jerry Adler):

Mnoštvo (kvota) nikada nije ni trebalo da se ispune; one su tu da bi ispitale tržište, da bi zbunile ili podrivale konkurentne algoritme, ili da bi usporile trgovanje neke deonice tako što bi zabušile system – praksa zvana „kvotno punjenje" [quote stuffing]. To čak može biti i druga deonica, ali čije se trgovanje odvija na istom serveru. Na internetu, ovo se naziva napadom uskraćivanjem usluga [denial-of-service attack] i to predstavlja zločin. Među kvantima, to se smatra u najmanju ruku lošim ponašanjem.[46]

Dojne Farmer (Doyne Farmer), ko-direktor programa za složenu privredu na Oksfordovom Institutu za Novo Ekonomsko Mišljenje, primećuje kako „pod aukcijskim prioritetom cene-vremena ogromna prednost

je data brzini."[47] Pošto se opažanje i odluke takođe moraju ticati mikro-vremenskih uslova, radi izbegavanja nasumičnog ponašanja (ili pre radi uvođenja nasumične neodređenosti slučajnosti), kvanti (finansijski sleng za kvantitativne analitičare koji razvijaju algoritme) su shodno tome radili na programiranju sposobnosti odlučivanja i uključili je u finansijske algoritme. Farmerova izjava stoga daje povoda da se tumači kao podsticaj da se uvedu prepreke kako konkurenciji tako i drugim insajderima (poput regulatora). Ostavljajući ih u neznanju povodom algoritamskih procesa ne samo da povlači za sobom neravnopravnu konkurentnu prednost, nego u krajnjem vodi do tehnoloških politika segregacije koja se svodi na preživljavanje najjačih kvanata.[48] Feliks Salmon (Felix Salmon), finansijski bloger za Rojters, komentarisao je: „u nekom trenutku u budućnosti, značajne gubitke će neizbežno pretrpeti oni investitori koji nemaju direktne veze sa VFT svetom koji je toliko složen da su njegove moguće sistemske posledice bukvalno nespoznatljive".[49] Možemo sa sigurnošću reći da takav razvoj samo nastavlja logiku grabljivice i plena koja dovodi konkurentnost tržišnog kapitalizma do sasvim novog nivoa, koja uzgred pravi ruglo od pravosuđa.

Ključno pitanje nije pitanje (ne)jednakosti investicijskih mogućnosti – kojem metafora grabiljivice i plena može biti odgovor. Mnogo radikalniji efekti se „rađaju" putem procesa odlučivanja: ne možemo odlučivati o onome što ne vidimo. Uočavanje je bar u nekom od svojih manifestacija – bile one vizualne, tekstualne, tehnološke, algoritamske ili drugo – uslov za apercepciju i odlučivanje. Mišel Seresov (Michel Serres) pojam parazita/domaćina čini se dosta prikladnim da bi se opisala nova kapitalistička hegemonija koja postaje očigledna u preplitanju crne kutije vremenskih odsečaka i crne kutije vlasničke tehnologije, u kojoj se čak ideologija „slobodnog tržišta" svodi na puki apsurd, budući da veštački

čulni organi vlasništva mogu prodreti duboko u mrak koji su vlasnici čuvali daleko od očiju javnosti kao da je njihov posed neko neotuđivo pravo. Uzevši sušti uticaj kapitalističkih tržišta na društvo i moć odlučivanja u kojoj uvek prevagne finansijski nad javnim interesom – stanje koje smo gledali iznova i iznova tokom poslednjih nekoliko godina – ovo se ne tiče samo onih pojedinih investitora kojima se botovi neposredno hrane (Salmonova briga) nego i milijarde ljudi koji su „investirani" kao resursi u parazitski sistem koji je u isto vreme i domaćin.

**Parazitski domaćin**

Ovo je zaista onaj vrli novi svet koji pokušavamo da regulišemo.
—— Komesar Komisije za trgovinu robnim fjučersima (KTRF) Skot O'Malia[50]

Izbledeo ekran na CNBC-u, nakon skretanja pažnje sa prenosa grčke pobune na neobjašnjiv upliv sve opasnijih tržišnih podataka nije samo slučajan spoj događaja ili nekakav nesrećan udes. Pre će biti da „Flash Crash" dokazuje moć sklopa kvantitativnog odlučivanja. VFT nije pretrpeo posledice nakon kolapsa. Upravo suprotno, stekao je prednost nad drugim učesnicima u tržištu. Štaviše, postalo je očigledno da je on nejasan onima koji su zvanično postavljeni da regulišu te prakse. Drugim rečima, regulatori se ne nalaze u povlaštenom položaju. Sasvim obrnuto, prema KHV-ovim zvaničnicima, odlučujuća nadmoć VFT korporacija nad političkim nadzornim telima se zapravo potvrdila kada su priznali da se izvođenje i sastavljanje toka podataka od nule – što bi im omogućilo nadzor tržišne aktivnosti – naprosto pokazalo previše složenim. Otuda se KHV morao osloniti na skup podataka domaće radinosti jedne VFT komapnije. „Te godine (godine „Flash Crash"-a) ogroman jaz između tehničke umešnosti onih koji

regulišu i onih koji su regulisani postao je bolno jasan. To je navelo KHV da razmotri mogućnost upošljavanja strane firme koja bi mogla da obezbedi jednominutne tokove podataka iz javnih razmena."[51] Iako se ovaj potez dočekao sa dobrodošlicom, taj ugovor odaje paradoksalnost politike koja prati logiku manjeg zla: snabdevač podataka kojeg je KHV unajmio, Trejdvorks, jedan je od VFT trgovačkih firmi.[52] Njihov generalni direktor, Manoj Narang, jedan je od čuvenih pobornika koji zagovaraju da se odlučivanje utemelji na samom toku podataka.[53]

Igra koja se vizualno predstavlja putem promenljivih brojeva na TV ekranima širom sveta postala je zapravo nevidljiva i izmiče znanju čak i onih koji su uključeni u nju, pošto se parazitski sklopovi koriste tehnologijom da bi sakrili prilike u kojima izvlače vlastiti profit. Kao što je primetio Erik Hunsader, „mi dopuštamo ljudima sa bržim pristupom mreži da postavljaju ili uklanjaju ponude i uloge brže nego što brzina svetlosti može preneti te informacije drugim tržišnim učesnicima."[54] Stoga takve prakse remete okosnicu logike tržišnog kapitalizma, raspodelu dobara zasnovanu na ponudi i potražnji; na ironičan način, „nevidljiva ruka" Adama Smita dobija novi smisao. Nakon tehnološko-kvantitativnog zaokreta u finansijama, sam pristup toku podataka ništa ne rešava niti može ići u korak sa VFT jedinicama velikih korporacija. Tehnološki razvoj čini skok unapred, kao i proizvodnja znanja. U oblasti tehnopolitika, kritičari lamentuju, a regulatori zaostaju uprkos činjenici da su preduzeti ogromni koraci da bi se taj jaz smanjio. Tokom 2010., KHV, koji je do tada upošljavao većinom pravnike, počeo je da zapošljava sve više tehničko osoblje. Ali, kao što jedan novopečeni specijalista, ekonomista Rik Bukmaster priznaje za *Vašington post*, ulozi su veliki a kocka se može olako izgubiti zahvaljujući nedostacima konkurencije:

Ovaj posao ne mogu obaviti pravnici KHV-a niti zaposleni u vladi. [...] Moramo namamiti u vladu one tržišne profesionalce koji mogu držati korak sa onima iz industrije. [...] Izazov je [...] u tome da se okupe talenti iz oblasti kompjuterskih nauka pre nego što diplomiraju, jer bi u suprotnom onda [...] trgovali za hedž fondove. Moramo se osloniti na duh javnosti a ne na dolare da bi ih tu doveli.[55]

Ovo dokazuje količinu perverzije svojstvene finansijskom sistemu. Pošto su ih prvo namamili visokim platama iz manje unosnih oblasti poput nauke i proizvodnje, inženjeri, matematičari i fizičari se potom navode da pomognu u napadu na ovu novu hegemoniju. To dokazuje preteranu izloženost [overexposure] tržišta u društvu: uvrnutiju, ako ne već lažnu, verziju duha javnosti bi teško bilo naći. Iako se to svodi na okupljanje odmetnika koji bi bili orni da se „žrtvuju" za opšte dobro, finansijski kapitalizam kao takav ostaje netaknut. To „opšte dobro" čini se kao daleki vapaj u odnosu na, primera radi, javnog dobra koje bi se zaista promenilo kada bi se raskinule dužničke veze koje uspostavljaju samo tržište i sama finansijalizacija.

Stoga, složeni, samo-stvarajući, samo-kopirajući, samo-referentni registri algoritama predstavljaju deo većeg medijuma cirkulacije informacija. Opremljeni tako da se koriste minijaturnim neefikasnostima (u finansijskim terminima, arbitražama), ono što se nazivalo trkom do nule (konkurentnom bitkom do postizanja tehnoloških mogućnosti trgovanja na brzinama bliskim brzini svetlosti) sada se usmerava na dublje nivoe eksploatacije koja povezuje ove mašine male latencije (odn. neverovatno malog zastoja u procesuiranju) na sporije mreže finansijske infrastrukture, i odatle na šire društvene mreže. U okviru logistike inherentne VFT-u, distribucija ja ključna. Automacija ne samo da stvara materijalne stavke (u našem primeru, ponude i uloge) nego takođe određuje uslove isporuke narušavajući „polje homogenosti" fin-

ansijske mreže. Drugim rečima, postoji težnja da se podjednaki pristup mašinama na mestima razmene ukine tamo gde vlada VFT. Pri automatizovanom širenju kvota, primera radi, nije reč o tome da se izvlači korist iz tržišne likvidnosti putem opšteg uparivanja ponude i potražnje (uloga i ponuda), što se odražava na cene. Pre će biti da te šeme *jesu* ono što stvara cene narušavanjem ponude i potražnje, putem privlačenja i tehnološkog zavaravanja manje povlaštenih sklopova. Kao proizvođači šuma (mnoštva kvota koje služe kao zamke likvidnosti), ti paraziti su samo prvi na redu među mnogima koji se hrane na domaćinu koji zauzvrat parazitira na eksploataciji arbitražnih prilika, i tako dalje. „U lancu parazita, onaj poslednji uvek pokušava da prevlada vlastitog prethodnika."[56]

Izvojevane između interesa korporacija koje mogu priuštiti sebi da izdrže sve veća poskupljenja, transakcije koje se isporučuju unutar infrastrukture trgovačkih mašina stvaraju utisak virtualnog, ako ne nematerijalnog bojnog polja koje je samo tek na nekim mestima materijalno uslovljeno. Ipak, tačka oslonca na kojoj se oslanja poluga ovog rata u brzini jeste geografski položaj. Kao što je navedeno ranije, što je manji prostor između vlasničkog trgovanja i razmenskih mašina, to se proces brže odvija i time je sve veća konkurentna prednost za onoga koji može da optimizuje logistiku VFT automacije.

Brzina je suština. To je razlog zašto uz VFT „informacijski gradijent" kojeg su pominjali Vilkins i Dragos postaje samo brzinski gradijent. „Trend koji je počeo sa golubovima završava se sa subatomskim česticama, podaci koje oni nose zastareli su gotovo već pre nego što stignu na odredište."[57] Čak i ako postoji apsolutna granica ovih razvoja, jaz je otvoren, zjapeća ali nevidljiva provalija: eksploatišući vremenske skale iznad praga percepcije, nova klasa ograđivanja pronašla je efikasna sredstva da sakrije svoje mahinacije kako od sporijih konkure-

nata tako i od javnosti. U ovoj oblasti, pojam apercepcije Vilhelma Lajbnica prestao je da označava svesno iskustvo koje nastaje iz malih, nesvesnih percepcija. Mnoštvo matematički konstruisanih malih percepcija (od kojih neke poput kamera nisu nimalo „nesvesne") određuju virtualno polje mašinske apercepcije gde se oni koji ne komanduju najnovijom kiborg-infrastrukturom naprosto hvataju ili blokiraju. Arhitektura finansijskih tržišta i njena algoritamska logistika postala je crna kutija ne samo s obzirom na parametre zvaničnih istraga, nego i s obzirom na mogućnosti saznanja u mnogo opštijem smislu. Dakle, ono što crna kutija otkriva nisu informacije nego šum. Ovo *tehnoznanje* (da izmislimo termin za spoj tehnologije i znanja izvan ljudske apercepcije) vrši uticaj ne samo na većinu industrije nego po nužnosti narušava javni forum kao celinu. Suočavamo se sa globalnim sistemom koji dela ne samo u mraku nego i u „dubinama vremena".

Dok je prošlost nasumična figura, nedovoljan ali ipak dosta cenjen stohastički rezervoar istorijskih podataka podešenih da modeluju buduće mogućnosti, budućnost se pretvorila u postajanje koje zamračuje sam pojam momenta. Na horizontu ljudskog iskustva, nasilje je obuhvatilo ono čemu se ne može dati ime, dok bljesci njegovog *sada* nemaju nikakvog otvora. On udara samo koleteralno. Kada se *taj* trenutak pretvori u momenat (istog momenta koji nastupa tek delić posle mikro-trenutka) i kada šum počinje da se naduvava u mehur, provalija tržišnog pada otvara bezdansku jamu „kapitulacije" na svim frontovima.[58] Iznenada, beznadežni idiom koji se pominjao na prenosu CNBC-a, otkriva svoj patološki smisao: on se manifestuje kao napad na bespomoćnu publiku - kapitulacija nije ništa drugo do vapaj za bejl-autom. Parazit uzima domaćina za taoca, ucenjujući ga dugom. Stoga, pravi derivativ – ono što zavisi od i u isto vreme temelji tržišta rizika – nije rizik u vidu proizvoda kojim se može trgovati

nego javnost kao poslednje utočište. Mi smo poslednji hedž.

**Budući forum i dvostruka figura stručnog svedoka**

Oni koji vrše moć uvek postavljaju stvari
tako da svojoj tiraniji daju izgled pravde.
— La Fonten (La Fontaine)[59]

Da nije puke matematičke apstrakcije, ikonoklastičkog „imaginarijuma" i neobjavljenih pravnih aranžmana što zamagljuju ono što se zbiva u mikrosekundama od bilo kakvog ispitivanja,[60] a kamo li istrage, izvršeno nasilje i pretrpljeni bol se ne bi tako olako potkrali pod okrilje hegemone ideologije slobodnog tržišta kao socijalne institucije. U ratu oko minijaturnih trajektorija budućih događaja (potencijala rizika) i neadekvatnosti koje se dešavaju u momentima koje mogu primetiti samo botovi (arbitražne prilike), svi oni koji ne ulažu u najnoviju varijantu programskih kiborga lišavaju sebe apercepcije i govora – a time i mogućnosti svesti i iskustva u opažanju i izražavanju. Štaviše, kao što smo videli, ono što se manifestuje u mikrosekundama izmiče istrazi i parnici. Može se reći da nasilje koje se vrši ispod praga političkih foruma (uključujući i pravnu jurisdikciju) podriva kako ekonomske tako i političke okvire koji su tu da bi ograničili režime moći. Ali u kodiranju je reč o relacionalnoj apercepciji zasnovanoj na osetljivosti na rizik te na meri i proizvodnji koja se nije razvila da bi obavljala komunikaciju direktno sa ljudima.

U veštačkom svetu života finansijske automacije, možda ne baš iznenađujuće, nije reč o slobodi i jednakosti. Tu je reč o borbi za prednost nad konkurencijom, ako ne i za monopol, i to je borba koja se bije na ravni na koju ljudi ne mogu stupiti. Prenos „Flash Crash"-a iz ono malo trgovačkih ureda na kojima ljudski trgovci još uvek predstavljaju tržišne činioce

pruža odlučujući dokaz u prilog promenljivoj nepodobnosti trgovačkog okruženja.[61] On takođe ponavlja Naneksov citat od gore: „Kada su se osmaci domogli lopte, svi ostali su pobegli iz panike i straha." Uprkos tome što su maltene svi svedoci uklonjeni sa mesta zločina (ko je od tržišnih učesnika ujedno i stručan svedok?), paradigmatska promena ka elektronskoj razmeni (na većini tržišta) omogućila je razvoj u potpunosti drugačijeg pojma svedoka, onoga koji bi mogao da dovede u pitanje to silovanje kalkulacijom: to je svedok koji je *izdajica i informant, odmetnik* koji krši nepisane zakone saučesništva i tajne. Pružajući materijal neobjavljenih ili poverljivih izvora na razne teme, ova figura uzbunjivača je tokom poslednjih godina načelno pretvorila svedoka u vesnika publike, kao onoga koji obelodanjuje dokaze o nasilju koji bi inače bili nedostupni. U finansijskom smislu, ova posebna manifestacija svedoka – koji ne svedoči na osnovu stvarnog prisustva – postaje medijum forenzike putem logistike redirekcije (npr. kada poverljivi materijal – o kojem se ne sme pričati – procuri u javnosti i takoreći, govori sam za sebe). Svedok nije puki informant. Finansijski odmetnik koji predstavlja objekte kao subjekte debate je stručni svedok koliko i naučni analitičar i saveznik koji time (re)konstruiše forenzički narativ tako što uspeva da sastavi sve činjenice. Priča o „Flash Crash"-u je primer od paradigmatskog i u isto vreme dvosmislenog značaja za neku moguću proizvodnju budućih foruma. On oslikava horizont izložene i diskontinuirane samo-regulišuće sile, u svoj njenoj složenosti, i postavlja ga naspram bezgranične utopije samo-regulišućeg tržišta.

Ova janusovska pojava udvostručenog stručnog svedoka može zaista biti figura u kojoj odjekuje složenost svih stanja sa kojima se suočava forenzika, u kojima „samo zločinac može rešiti zločin."[62] Pojam stručnog svedoka kao onoga koji je izvorno bio upleten u sam događaj pod istragom čini se da

naglašava Ahilovu petu ovog posebnog načina kalkulisanja tlačenja koje se odvija kroz VFT u vidu dela paradigme neoliberalnog tržišta. Zamršeni problem rešavanja „Flash Crash"-a uključuje jednu dvosmislenost: da bi se iznedrili dokazni podaci što su pohranjeni u delićima sekunde, potrebno je učešće insajdera ili čak (navodnog) zločinca. Ovo se ogleda u KHV-ovoj strategiji upošljavanja onih sa iskustvom iz prve ruke i koji su stručni za oblast koju žele da razotkriju i ispitaju:

Mihael Fioribelo (Michael Fioribello), 38, zna verovatno više o derivativima nego bilo ko drugi u agenciji. Pre nego što je otišao u KHV, radio je u AIG skoro jednu deceniju. Tamo je pomagao u rukovođenju derivativnim operacijama te kompanije […]. [On] je omogućio kolegama uvid u načine na koji finansijski igrači strukturiraju derivative da bi sakrili nešto što bi moglo biti ilegalno. „ […]  Tu se može zvoniti na sva zvona da bi se smanjila transparentnost ili nekako drugačije zaobišli federativnih zakoni o hartijama od vrednosti."[63]

Pored zapošljavanja odmetnika, dodatni dvosmisleni ali ključni cilj jeste ubrzavanje tehnološkog napretka da bi se održao korak sa industrijskim standardima koji su u stalnom razvitku.[64] Za razliku od špijunaže ili nadzora, istraživanje i nadgledanje još nepoznatih okruženja pokazuje sličnost sa kibernetskom *izvidnicom*. Vojna analogija otkriva problematiku pristupa regulatornog tela koje neprestano juri odbljesak večito promenljive linije fronta, kao što pokazuje gore navedena situacija u kojoj KHV prati tok podataka Trejdvorksovog vodećeg pobornika VFT-a.

Na kraju, nameće se još jedna dvosmislenost: *jedini izlaz* za zvaničnike, pravnike, aktiviste i javnost uopšte – jedini pravi put do javnog foruma koji napušta dominaciju bezgraničnih i neregulisanih (odn. samoregulisanih) tržišta – podrazumeva da se, makar privremeno, podrži i omogući otkrivanje vlasničkih finansijskih podataka javnosti – krivično

delo svugde osim tamo gde je izvor vlasnik. Jedino *solidarnost odmetnika* uperena protiv patološke deformacije mogućnosti saznanja unutar ovog ključnog polja savremenih odnosa moći, jedino je ta solidarnost sposobna da dostavi bitne informacije. Ovo je, da parafraziramo citat Lajbnica kojim smo započeli ovaj tekst, od ključnog značaja za apercepciju „moćnog huka" finansijskih tržišta. U svoj toj dvosmislenosti, reperformativna forenzička analiza izvedena na osnovu dvostruke figure kibernetskog stručnog svedoka predstavlja silu u stvaranju jednog tela jasnih performativnih prevoda koje uključuju nukleus budućeg foruma. Umesto okretanja jednostavnim odgovorima (ljudski faktor) ona direktno udara na složenost odnosa moći.

U skladu sa posebnom javnosti (u neoliberalnom rečniku, vlasnicima deonica), ova pobuna protiv rastuće hegemonije moći algoritamskih demona može olakšati poluge (pošto sam dokaz očigledno nije dovoljan) kojima bi se ponovo vratile u igru i u pravni forum korporativne parnice i političke forme legislacije. Ipak, *solidarnost odmetnika* prevazilazi finansijsko-državni kompleks. Ona oživljava osnovna načela demokratije tako što se direktno obraća javnosti radi opšte dobrobiti.[65] Budući forum očituje se kroz manifestacije i revolte koji se odupiru revnosti neoliberalizma koji preusmerava opasne bezdane krize dalje od vlasnika deonica i koji ih okreće ka celom društvu putem svrstavanja javnosti pod konkurentne vlasničke grupacije. Stoga, budući forum kroz višak kalkulacije prevazilazi potrebu za pravdom.[66] On će ukinuti parazitske vlasničke pregrade, potpomoći odlučivanje o i na obnovljenoj agori zajedničkosti i time će dati glas onima čija se neotuđiva prava zaista eksploatišu.

1. Gottfried Wilhelm Leibniz, *correspondence with Arnould,* October 9, 1687, u *Philosophical Writings*, trans. M. Morris (London: J.M. Dent & Sons, 1934), 85.

2. Eric Hunsader, "Coexisting without Colocating," *HFT Review* (Hunsader's blog), October 18, 2011, http://www.hftreview.com/pg/blog/erichunsader/read/12033/coexisting-without-colocating.

3. *The Wall Street Journal* je objavio nešto detaljniji sažetak dana posle pada – 7. maja 2010. Vidi: Lauricella and McKay, "Dow Takes a Harrowing 1,014.14-Point Trip," *The Wall Street Journal,* May 7, 2010.

4. Gary Dorsch, "The Forgotten 'Flash Crash'––One-year later," *Global Money Trends newsletter,* 2. maj 2011., http://www.sirchartsalot.com/article.php?id=152.

5. Vidi: "FLASH CRASH May 6, 2010 CNBC," http://www.youtube.com/watch?annotation_id=annotation_191025&feature=iv&src_vid=7UhKOs3dYk4&v=IJae0zw0iyU, pristupljeno septembra 2013.

6. Vikipedija objašnjava "finansijalizaciju" kao "pojam koji opisuje ekonomski sistem ili proces koji pokušava da svede svu razmenjuu vrednost (bez obzira da li je reč o predmetnim ili nepredmetnim, budućim ili trenutnim obećanjima, itd.) ili na finansijski instrument ili na derivative tog finansijskog instrumenta." http://en.wikipedia.org/wiki/Financialization, pristupljeno septembra 2013.

7. Na vebsajtu Arka, operativnog sistema koji se oslanja na Linuks, nalazi se kratka i obuhvatna definicija: „Demon je program koji radi u 'pozadini' procesa (bez terminala ili korisničkog interfejsa), obično nudeći usluge i čekajući da se dogode određeni događaji. Dobar primer je veb server koji čeka na zahtev da se prikaže stranica  [...]. Dok je tu reč o pravim aplikacijama, postoje demoni čiji rad nije toliko vidljiv." https://wiki.archlinux.org/index.php/Daemons, pristupljeno u septembru 2013.

8. Donald Mackenzie, *An Engine, Not a Camera* (Cambridge: MIT Press, 2006), 12.

9. Javier E. David, "ICE to Buy NYSE for $8.2 Billion, Ending Era of Independence," CNBC, 20. decembar 2012., http://www.cnbc.com/id/100330589.

10. „Centar podataka NJSE Euroneksta, međunarodnog konglomerata koji uključuje njujorške berze, zapravo je zgrada u predgrađu Mavaa, Nju Džersi, 27 milja od Vol Strita." Jerry Adler, "Raging Bulls: How Wall Street Got Addicted to Light-Speed Trading," *Wired,* 3. avgust 2012.

11. Igrom slučaja, automatizovani trgovački ured LLC bio je pionir u automatizovanom VFT uoči tržišnog pada 1987. To su opisali na svojoj internet stranici: „Dobrodošli u budućnost automatske trgovine [...]. To je svet u kome se takmiče samo najbrži. U njemu učestvuju samo oni koji su dovoljno brzi da predvide tržišne promene." http://www.atdesk.com, last accessed October 2013.

12. ElieAyache, *The Blank Swan: The End of Probability* (Chichester: Wiley, 2010), 421.

13. „Findings regarding the market events of May 6, 2010." Izveštaji osoblja KTRF-a i KHV-a zajedničkoj nadzornoj komisiji za sporove oko regulacije, 30. septembar 2010., http://www.sec.gov/news/studies/2010/marketevents-report.pdf.

14. Radi dva primera kritike povodom nalaženja izveštaja, vidi Tyler Durden (alias), "SEC Releases Final Flash Crash Report—Waddell And Reed Blamed As Selling Catalyst," *ZeroHedge*, October 1, 2010, http://www.zerohedge.com/article/sec-releases-final-flash-crash-report-waddell-and-reed-blamed-selling-catalyst; a radi jake kritike čak pre izlažnja zvaničnog izveštaja, Christopher Steiner, "Searching For Flash Crash Culprit, The SEC Fingers Wrong Man," *Forbes,* September 9, 2010, http://www.forbes.com/sites/christophersteiner/2010/09/09/searching-for-flash-crash-culprit-the-sec-fingers-wrong-man.

15. Naneksova konačna izjava, nazvana "Flash Crash Mystery Solved," 26. mart 2013, uz linkove ka pomenutoj istrazi može se naći na http://www.nanex.net/aqck2/4150.html, poslednji pristup septembra 2013.

16. Jedna Naneksova izjava ipak vodi ka drugačijem zaključku: „Razmena mailova [sa jednim od glavnih ko-autora izveštaja] bila je duboko uznemirujuća pošto je obrazloženje predstavljalo zapravo samo jednu novu i bizarnu definiciju likvidnosti [...] [koja] tvrdi da ako visokofrekventni trgovac (VFT) agresivno kupuje ugovore i ukoliko to izvrši na način suprotan zahtevima koje je naložio prodavac, onda se VFT može odrediti kao snabdevač likvidnosti, a prodavac kao korisnik likvidnosti. [...] To je upravo sušta suprotnost industrijski prihvaćenog shvatanja likvidnosti, pa i onog zdravorazumskog. To je kao kada biste rekli da je *gore* dole a *dole* gore. Čini se da su pokušali da podatke usklade sa preuranjenim zaključkom. [...] Zasnovati bilo kakve buduće regulacije na ovim člancima bilo bi pogrešno i nesmotreno. Neko bi trebalo da napravi jedno veliko čišćenje u KHV-u i KTRF-u." „The SEX Redefines Liquidity (when it's convenient)," Nanex Research, 12. April 2012., http://www.nanex.net/aqck/2977.html.

17. "Analysis of the 'Flash Crash'," Nanex, 18. jun 2010. (od tada ažurirano), http://www.nanex.net/20100506/FlashCrashAnalysis_Intro.html.

18. Transkript: Adam Taggart, "Eric Hunsader: Investors Need to Realize the Machines Have Taken Over. The Blink of an eye is a lifetime for HFT algos," *Peak Prosperity,* October 6, 2012, http://www.peakprosperity.com/podcast/79804/nanex-investors-realize-machines-taken-over.

19. *Ibid.*

20. *Ibid.*

21. "U.S. 'flash crash' report ignores research – Nanex," Sify Finance, 5. oktobar 2010., http://www.sify.com/finance/u-s-flash-crash-report-ignores-research-nanex-news-insurance-kkfiEjeciij.html.

22. Andrew G. Haldane and Benjamin Nelson, "Tails of the unexpected," paper presented at "The Credit Crisis Five Years On: Unpacking the Crisis," konferencija na Poslovnoj školi Univerziteta u Edinburgu,  8.–9. juna 2012., http://www.bankofengland.co.uk/publications/Documents/speeches/2012/speech582.pdf, 20.

23. "Analysis of the 'Flash Crash'."

24. Andy Mills, "Fast Cash Dash Flash Crash Clash: Hear and See Some Super Trading," Radiolab, February 6, 2013, http://www.radiolab.org/story/267356-fast-cash-flash-crash-mad-dash-clash/.

25. David Lauer in MarijkeMeerman, dir., "The Wall Street Code," documentary, 51 min, http://www.youtube.com/watch?v=kFQJNeQDDHA, at 46:00–46:48, pristupljeno novembra 2013.

26. Vidi, primerice, "May 6th 2010 Flash Crash Analysis: Continuing Developments Sell Algo Trades," Nanex, October 8, 2010 (since updated), http://www.

nanex.net/FlashCrashFinal/FlashCrashAnalysis_WR_Update.html.

27. Vidi "About" stranicu Naneksovog sajta, juna 18., 2010., http://www.nanex.net/20100506/FlashCrashAnalysis_About.html.

28. Luciana Parisi, *Contagious Architecture: Computation, Aesthetics, and Space* (Cambridge: MIT Press, 2013), x. Parisi prati „logiku *komputacije* i njen prodor u kulturu" (ix) u arhitekturalni i interaktivni dizajn. Iako se ona ne dotiče neposredno finansije, njen opis digitalnih algoritama se može primeniti na finansijske algoritme utoliko što ih ona opisuje kao „performativne entitete: aktualnosti koje biraju, vrednuju, transformišu i stvaraju podatke" (ix) i koji „nisu samo predstave podataka, nego i prilike od iskustva, utoliko što oni obuhvataju informaciju na vlastiti način" (xii–xiii).

29. „May 6th 2010 Flash Crash Analysis: Final Conclusion," Nanex, October 14, 2010, http://www.nanex.net/FlashCrashFinal/FlashCrashAnalysis_Theory.html.

30. Ova dosetka je tu s namerom da se opiše stanje savremene umetnosti. Suhail Malik, predavanje održano na California Institute of the Arts (CalArts), April 2, 2013, http://vimeo.com/71058588 (36:33-36:36). Odnos između savremene umetnosti i finansija i njihove podležeće zavisnosti od neodređenosti a manje od nejasnoće, biće objašnjen u sledećem tekstu autora.

31. Radi opisa pozadine „Flash Crash"-a odnosno algoritamskog trgovanja, vidi: MarijeMeerman, dir., *Money & Speed: Inside the Black Box* (Netherlands, 2013), 49 mins., http://www.youtube.com/watch?v=H4BzsevJthw; and *The Wall Street Code* (Netherlands, 2013), 50 mins., http://www.youtube.com/watch?v=kFQJNeQDDHA, both last accessed November 2013.

32. „The Rise and Fall of the HFT Machines," Nanex Research, http://www.nanex.net/aqck/2804.HTML, accessed September 2013.

33. Likvidnost je ključna radi otkrivanja cena. Ona predstavlja mogućnost trgovanja na osnovu tražene cene (uz manje varijacije) zbog dostupnosti kupaca odnosno prodavaca. Stoga, ona podrazumeva stalnu razmenu informacija i trgovanja. Gubitak likvidnosti podrazumeva neprihvatljive cene koje mogu dovesti do pada.

34. Vidi primerice časopis MIT Technology Review koji ima članak o kvantnom preduzetniku, ManojNarang: Bryant Urstadt, "Trading Shares in Milliseconds," *MIT Technology Review,* December 21, 2009, http://www.technologyreview.com/featuredstory/416805/trading-shares-in-milliseconds.

35. InigoWikins and Bogdan Dragos, "Destructive Destruction? An Ecological Study of High Frequency Trading," *Mute,* January 22, 2013, http://www.metamute.org/editorial/articles/destructive-destruction-ecological-study-high-frequency-trading#.

36. Tyler Durden, "Nanex: Investors Need to Realize the Machines have Taken Over," October 6, 2012, *Zero Hedge,* http://www.zerohedge.com/news/2012-10-06/guest-post-nanex-investors-need-realize-machines-have-taken-over.

37. O tome u "U.S. 'flash crash' report ignores research."

38. Vidi Parisi, *Contagious Architecture.*

39. Adler, "Raging Bulls."

40. Izraz „neracionalno bogatstvo" upotrebio je bivši predsednik odbora Federalnih Rezervi Alan Grinspan, da bi opisao eksploziju „Dot Com" sektora i mogućnost njegovih razarajućih posledica. "Remarks by Chairman Alan Greenspan,"na godišnjem ručku i Frensis Bojer predavanju u okviru Instituta Američkih Preduzeća za istraživanje javnog mnenja, Vašington, 5. decembar 1996. http://www.federalreserve.gov/boarddocs/speeches/1996/19961205.htm, poslednji pristup septembra 2013.

41. Gilles Deleuze, *The Fold: Leibniz and the Baroque*, trans. Tom Conley (Minneapolis: University of Minnesota Press, 1993), 64.

42. Ovaj problem sociolozi finansija poput Donalda Mekenzija i drugih često uzimaju kao osnov svojih prigovora. Vidi takođe fusnotu 60.

43. Što se tiče „Flash Crash"-a, Naneksova poslednja izjava na temu tog slučaja završava se sledećom primedbom: „VFT lobi će čvrsto poricati bilo kakvu krivicu za izazivanje pada i umesto toga argumentovaće i napadati vetrenjače, i u krajnjem će se pozvati na KHV-ov izveštaj koji okrivljuje Vadel&Rida za taj slučaj [...] To je veoma složeno pitanje i lobisti će ga koristiti da bi vas zbunili." Nanex, "Flash Crash Mystery Solved."

44. Wilkins and Dragos, "Destructive Destruction?"

45. Trgovanjem pred rebalans indeksnih fondova institucionalni investitori iskorišćavaju trgovanje algoritamskim programima deljenjem velikih dogovora na mnogo malih trgovina da bi se tako raspodelili rizici. Stoga, algo trgovci parazitski vrebaju plen od investitorovih povraćaja. Radi detaljnog opisa različitih strategija koje koriste algo trgovci vidi Scott Pattersen, *Dark Pools* (New York: Crown Business, 2012).

46. Adler, "Raging Bulls."

47. J. Doyne Farmer, "The impact of computer based training on systemic risk," 11. Paper presented at the London School of Economics, January 11, 2013, http://www.lse.ac.uk/fmg/events/conferences/Systemic-Risk-Centre/Foresight-Report_110113/Papers-and-slides/Doyne-Farmer.pdf.

48. Kao što je pomenuto ranije, finansijsku regulaciju u velikoj meri sprovodi sama industrija.

49. Vidi Will Knight, "Watch High-Speed Trading Bots Go Berserk," August 7, 2012, http://www.technologyreview.com/view/428756/watch-high-speed-trading-bots-go-berserk.

50. Scott O'Malia, quoted in KambizForoohar, "Trading Pennies Into $7 Billion Drives High-Frequency's Cowboys," Bloomberg, October 6, 2010, http://www.bloomberg.com/news/2010-10-06/trading-pennies-into-7-billion-profit-drives-high-frequency-s-new-cowboys.html.

51. Dina El Boghdady, "SEC going high-tech with real-time trade data," *The Washington Post,* Dec. 24, 2012.

52. Vidi http://www.tradeworx.com/.

53. Vidi Urstadt, "Trading Shares in Milliseconds."

54. Laurence Knight, "A dark magic: The rise of the robot traders," BBC News, July 8, 2013, http://www.bbc.co.uk/news/business-23095938.

55. Zachary A. Goldfarb, "SEC is hiring more experts to assess complex financial systems," *The Washington Post,* June 15, 2010.

56. Michel Serres, *The Parasite* (Minneapolis: University of Minnesota Press, 2007), 4.

57. Adler, "Raging Bulls."

58. Pojam šuma – kao suprotnosti informacije – prvo je razvijen u teoriji cena kod sledećeg autora: Fischer Black in "Noise," tekst pročitan na 42. sastanku Američke finansijske asocijacije, Nju Jork, 20.-30.decembra 1985., objavljen u: *Journal of Finance,* vol. 41, issue 3 (July 1986): 529–543.

59. La Fontaine (1668).

60. Endru Lo, direktor Laboratorije za finansijski inženjering na MIT-ovoj Sloan školi menadžmenta, osvrnuo se na taj problem na Konferenciji o sistematskom riziku i sporovima oko podataka u 2011. pominjući studiju koju je izveo o „kvant-nom padu" 2007.: „bilo nam je malo čudno povodom toga pošto [...] znate sigurno da ima ljudi koji znaju šta se tačno dogodilo ali neće da pričaju. Tako da, u suštini ceo ovaj članak može biti naučna fantastika ili bi mogao biti pun pogodak, nemamo pojma. Do dana današnjeg ne znamo zašto niko ne priča o tome. Nekima je zabranjeno da pričaju kako ne bi osujetili vlastite deoničare." Video dostupan na http://www.youtube.com/watch?v=nuDIoBeNwD0 (see 13:20-13:55), pristupljeno u septembru 2013.

61. U toku žestokih momenata tokom „Flash Crash"-a, Ben Lihtenštajn, (the "voice of the CME S&P futures pit") izjavio je (primera radi): "Ovo će oduvati ljude na neverovatan način, na način koji ne možete ni da zamislite." Traders Audio, "May 6 2010 Stock Market Crash," 12 maj. 2010., http://www.youtube.com/watch?v=1mC4tu1NhUA.

62. Ovo je podnaslov odeljka o forenzičkoj arhitekturi iz: Eyal Weizman, *The Least of All Possible Evils: Humanitarian Violence from Arendt to Gaza* (London: Verso, 2012)

63. Goldfarb, "SEC is hiring more experts."

64. *Ibid.*

65. Njeno nesigurno i ranjivo stanje u informatičkom kapitalizmu možda je u nekoj meri uslovljeno nedovoljnim koalicijama protiv globalne investitorsko/deoničarske hegemonije – ključne protivteže režimima moći koje su, primera radi, vršili sindikati u toku industrijskog kapitalizma.

66. U svetlu automatizovanih algoritamskih praksi pod kojima se budućnost eksploatiše stvaranjem arbitražnih prilika u mikrosekundama, budući forum će biti protiv-budućnosni forum u kojem se delatni subjekt oporavlja od kapitalističke zatvorenosti osadašnjene-budućnosti – između ostalog, koristeći, a ne bivajući iskorišten od, algoritamskih procesa.

*Prevod sa engleskog: Aleksandar Matković*

IZLOŽBA

# Autonomije

07 – 28.11.2013.

*Muzej savremene umetnosti Vojvodine*

*Dunavska 37, Novi Sad*

Umetnice/ci:

Darija Medić SRB

Emilio Vavarela IT

Geraldine Juarez SE

Heath Bunting UK

Jan Lemic DE

Džoana Mol ES

Les Mislerebles SRB

Matthias Tarasiewicz AT

Shinseungback Kimyonghun KR

Stevan Kojić SRB

Wonbin Yang USA

Zvonko Gorečan SRB

Izložba *Autonomije* kroz umetnička istraživanja ispituje složene odnose tehnološkog razvoja i ekosistema. Pojam autonomije u ovom značenju primarno predstavljaju autonomiju u sferi automatizacije i nivoa samostalnosti algoritama i hardverske osnove. Pojam mašinskih autonomija neizbežno prate i propitavanja položaja čoveka u mašinizovanom ekosistemu i čovekovih autonomija i kibernetičkih povratnih sprega.

Tehnološki razvoj zasnovan na mašinskoj autonomiji proizveo je entuzijazam ali i strahove, što je emotivno i teorijsko bojno polje koje će opstati sve do 21. veka. Paralelno sa tehničkim izazovima, postoji problematizacija nezavisnosti autonomnog sistema, njegovog etičkog položaja spram čoveka, kapaciteta da uči i da se usavršava. Sa stanovišta međuodnosa društva i tehnologije, koncept autonomije se najlakše može definisati kao nezavisnost od upravljanja ili u krajnjoj liniji, kao nezavisnost od kontrole. Prepuštanje pojedinih društvenih, kognitivnih i bioloških procesa mašinskoj inteligenciji i odlučivanju otvorilo je kod mnogih strahove da

bi takav scenario otrgao od čoveka one ključne procese odlučivanja koji su ga definisali kao društveno biće.

Potreba da se mašine učine što nezavisnijim od okruženja sa mogućnošću samostalnog delovanja u odnosu na čoveka, proizvela je rast efikasnosti, emancipaciju čoveka od otuđujućeg serijskog (manufakturnog ili kasnije fordističkog) modaliteta rada, talas tehnološke nezaposlenosti, ali i potpuno nova područja ekoloških rizika.

Pitanje mašinskih autonomija je ispunjeno savremenim mitologijama i realnostima. Sa jedne strane postoji određena mistifikacija algoritamskog aktera i operacija koje obavlja u složenim svakodnevnim operacijama, a sa druge strane u društvu postoji izbegavanje suočavanja sa realnostima algoritamskog ekosistema i njegovim realnim uticajem u svetu. U svetu berzanskih finansijskih algoritama taj značaj je možda i najvidljiviji, iako sam proces finansijskih operacija ovih algoritama je daleko od transparentnog.

Većina radova na izložbi je izbor radova koji su pristigli na konkurs. Radovi na izložbi predstavljaju umetnička istraživanja fenomena HFT (visoko frekventne trgovine), mašinskih grešaka na primerima Google street view-a ili fejsbukovog face recognition softvera. Neki radovi se bave autonomnim sistemima monitoringa granica, a neki radovi izbegavanjima elektromagnetnih polja. Značajan deo izložbe je fokusiran na odnos ekološkog i tehnološkog, od analize velikih tehnoloških sistema i njihovim prožimanjem sa lokalnim ekosistemima, do mikroekoloških intervencija.

Koncept:
Kristian Lukić, Sunčica Pasuljević - Kandić

Produkcija:
Institut za fleksibilne kulture i tehnologije – Napon

Koprodukcija:
Zavod za kulturu Vojvodine,
Muzej savremene umetnosti Vojvodine

Izložba je deo međunarodnog projekta *Tehno-Ekologije* u saradnji sa Centrom za nove medije RIXC iz Rige, Baltan Laboratories iz Ajndhovena, Finskim društvom za bioumetnost iz Helsinkija i Ars Longa iz Pariza.

Podrška:
Program EU Kultura, Sekretarijat za kulturu i obrazovanje AP Vojvodine, Ministarstvo kulture Republike Srbije, Grad Novi Sad.

### Emilio Vavarela / Italija

**Prijavi problem,** jednokanalna video projekcija; 07':35" Boja. Bez zvuka. Bez prevoda. (2012).

Emiliov rad bavi se autonomnim sistemima koji su uključeni u sisteme socijalne kontrole, kao što je Gugl korporacija, istražujući estetiku algoritmičkih grešaka. Njegov rad pokazuje da nijedna tehnologija ili autonomni sistem, bez obzira koliko je moćan, nije ultimativna tehnologija u kojoj nema mesta za grešku.

Serija od 100 digitalnih fotografija, *Prijavi problem* je prvi deo projekta *Gugl triologija*. U projektu Gugl triologija radi se o vezi između čoveka, moći i tehnoloških grešaka. Prijavi problem je poruka koja se pojavljuje pri dnu Google Street View ekrana, koji omogućava gledaocu da prijavi problem tokom pregledavanja mesta koje virtualno posećuje: nedostatak cenzure, pogrešne boje, nasumična pojavljivanja. Rad je nastao dok je umetnik putovao virtuelnim ulicama Google Street View-a, fotografišući sve „pogrešne pejzaže" na koje je nailazio pre nego što je neko drugi uspeo da prijavi problem i podstakne kompaniju da podesi slike. Uobičajni pejzaži transformisani su goglovim neočekivanim greškama u nešto sasvim novo.

**Vozači i kamere,** štampa arhivskih fotografija na fotopapiru, 11 elemenata, 10cm (2012).

*Vozači i kamere* je drugi deo projekta *Gugl triologije*. Svaki Google Street View auto opremljen je Dodeca 2360 kamerom sa jedanaest sočiva koja je sposobna za fotografisanje u 360 stepeni. Nakon toga fotografije se slažu stvarajući stereoskopski prikaz i guglov algoritam automatski zamuti lica ljudi kako bi zaštitio privatnost onih koji su slučajno fotografisani. Kako bi napravio ovu seriju fotografija

umetnik je krenuo u potragu za licima koja su umakla algoritmu Google Streeet View-a. Jedanaest portreta, koje je umetnik izolovao ovekovečuju vozače guglovog automobila. Vozač postaje neka vrsta fantomske moći; pojavljuje se tamo gde ne treba da bude i njegovo prisustvo izmiče cenzuri. Njegovo lice je simbol greške, ali u isto vreme pokazuje ljudsku stranu i "možda" granice tehnološke moći.

Emilio Vavarela je italijanski umetnik čija se umetnička praksa fokusira na političku filozofiju i savremenu tehnološku moć sa posebnim osvrtajem na estetiku greške, subjektivnost, posredovani identitet, biopolitičku i socijalnu kontrolu. Kroz upotrebu novih likovnih medija on ističe dvosmislen prostor moći, kao što su neočekivane greške i nepredvidljivost. Trenutno završava master studije na Iuav univerzitetu u Veneciji sa tezom „Greške i metamorfoze u novim likovnim medijima".

### Darija Medić / Srbija

*Into the blind-Model 300*, softverska umetnost, video (2012).

*Model 300* je tehno-psihološki navigacijski eksperiment – naprava za navigaciju koja podstiče promišljanje o paranoičnim interpretacijama tehnologije, tražeći puteve sa manjim elektromagnetskim frekvencijama u urbanim prostorima.

Koncept „autonomije" u Darijinom radu primarno je orijentisan ka autonomnim sistemima i njihovoj upotrebi za dobrobit ljuskog zdravlja. Tokom procesa menjanja izvornog koda, ideja o „najkraćem putu" kao „najbrži način za rešenje problema" postaje evidentni temelj programiranja. Ideja sprovođenja ovog eksperimenta bila je da se protegnu posledice smetnji kod koda u dinamici savremenih tehnoloških praksi. Tehnološki razvoj vođen je institucionalnom i socijalnom klasnom dimenzijom,

ali Darijin rad pokazuje da otvorene sisteme i tehnologiju možemo iskoristiti za opšte dobro a da uz to budemo i kreativni.

Darija Medić je medijska umetnica i istraživač koja kroz upotrebu jezika, tehnologije i dizajna istražuje područje korekcije/krađe/građenja identiteta i lavirinata savremenih tehnoloških praksi. U svojim aktivnostima se zalaže za autonomne oblike učenja i umetničke delatnosti kao potencijal za individualnu i društvenu emancipaciju. Završila je Umrežene medije na Pit Cvart institutu u Roterdamu, Holandiji i Nove likovne medije na Akademiji Umetnosti u Novom Sadu, Srbiji.

## Džeraldina Juarez / Švedska

### *Fleš kreš*, Instalacija, (2013).

Džeraldina koristi tržišta kao materijal za docrtavanje kultne prirode finasijskog kapitalizma. Visoko kompleksni mehanizmi tržišta se uvek predstavljaju kao najjednostavnija moguća slika: Horizont, jednostavna linija koja odvaja zemlju od neba. *Fleš kreš* je najbrži berzanski pad do sada, kada je tržište palo u nekoliko sekundi, da bi se povratilo nekoliko minuta kasnije. Pad su prouzrokovali algoritmi visoko frekventnog trgovanja. Poigravajući se sa prirodom kulta tržišta, ova lažna zlatna instalacija je pokušaj otkrivanja izobilja koja govori  protiv nestašice retorike koju promoviše ekonomski liberalizam. Koncept „autonomija" u njenom radu se primarno odnosi  na autonomije u sferi automatizacije i nivoa samostalnosti algoritama i hardverskih osnova.

Džeraldina Juarez je meksička umetnica koja živi u Švedskoj. Koristi tehnologiju i pirateriju za interakciju i odražavanje na prostore, sisteme i situacije koje proizlaze kada se informacija, svojina i moć sudare. Takođe istražuje, bloguje i objavljuje tekstove o beskonačnoj napetosti između intelektualne svojine i kulture kopiranja.

## Hit Bunting / Velika Britanija

### *Parabole automatskog novca,* print (2013).

Počinjući sa nešto novca i koristeći razne tehnike promene stanja (mesta, društvene strukture i poseda), algoritam automatski prati pravila Sistema pronalazeći metode u sticanju više novca.
Primeri:
1. Kupi računar, otvori firmu i otvori račun u banci.
2. Kupi olovku i apliciraj za kreditnu karticu.
3. Kupi nož, napravi olovku, registruj se kod doktora, primi opasnu injekciju, ostani nepokretan i zatraži državne olakšice.
4. Kupi autobusku kartu, idi i kupi računar i otvori štedni nalog.

Hit Bunting je britanski umetnik koji živi u Bristolu. Njegov rad se fokusira na razvoj otvorene demokratije i komunikacionih sistema kao i socijalnih struktura na  internetu i u javnim prostorima. Teži da postane vešt član javnosti i trenutno trenira umetnike tehnikama preživljavanja kako bi mogli da nadžive mreže organizovanog kriminala tokom finalne krize. On je suosnivač mreža net.art i www.irational.org. Stvario je mnogo akreditovanih radova. Buntingonovi radovi su naručivani i izlagani u raznim priznatim prostorima. Predavao je na mnogim univerzitetima.

## Stevan Kojić / Srbija

### *Izgubljeno blago*, instalacija, (2013).

*Izgubljeno blago* se zasniva na iniciranju bio/tehno-muzeološke zbirke sačinjene od fiktivne kolekcije elektronskog otpada (tehno-objekata) i živih organizama (bio-objekata) navodno pronađenih na neposrednom „lokalitetu".

Polazeći od samokritičnog odnosa prema dosadašnjim site-specific, in-situ i eko-art praksama uz autoironični pristup i angažovanje uobičajenih „metoda istraživanja" datog mesta, dobijene istorijske, socijalne, geo-političke i tehno-biološke informacije se transformišu u nove sintetičke forme. Kroz subjektivni doživljaj okruženja, spekulativno se nagoveštava jedno moguće/nemoguće stanje u paralelnoj sadašnjosti ili budućnosti. U imaginarnom post-apokaliptičnom dobu, odbačeni objekti postaju aktivni subjekti tehno-bioloških struktura novih virtualnih svetova kao potencijalni mikro modeli futurističkih megapolisa.

Stevan Kojić diplomirao je 1997. godine na Fakultetu likovnih umetnosti u Beogradu na katedri za vajanje i magistrirao na istom fakultetu 1999. Od 2004. godine je asistent na Katedri za nove likovne medije na Akademiji umetnosti u Novom Sadu, a 2008. postaje docent. Učestvovao je na međunarodnim simpozijumima , projektima, grupnim i samostalnim izložbama u Evropi i inostranstvu. Kojićeva interesovanja se kreću u okvirima privatno – javno, niske tehnologije - visoke tehnologije, ekologija - ekonomija itd .

## Zvonko Gorečan / Srbija

### RGB, video projekcija (2013).

Čak i uz smanjenje korišćenja fosilnih i nuklearnih goriva i uz povećanje obnovljivih izvora energije, što je do juče bilo nemoguće, mi i dalje nastavljamo da zagađujemo našu okolinu. Imajući ovo u vidu, umetnik nastavlja da istražuje ovaj predmet van glavne oblasti njegove prakse. Njegova razigrana i živopisna društvena igra služi kao igralište za publiku da se uključe u potragu za pronalaženjem najboljeg načina za korišćenje energije koja im je trenutno na raspolaganju.

Zvonko Gorečan se nakon završenih studija elektrotehnike bavi istraživanjima iz oblasti stabilnosti sistema, a kasnije i iz oblasti menadžmenta sistema, odnosno SmartGrid-a. Autor je više desetina radova i knjiga iz navedenih oblasti. U daljem radu svoje istraživanje usmerava ka produbljivanju dela kulturne prakse koje se vezuju za različite energetske potrebe različitih delova društva, odnosno traženju benefita nastalog debalansa, koji u relaciji sa Informacionim Tehnologijama, mogu dovesti do stabilinijeg energetskog sistema. Trenutno je vodeći stručnjak na projektima u naprednim evropskim kompanijama iz oblasti Smartgrid-a (Italija, Danska i Rusija). Član je Eastwood - Real Time Strategy Group.

## Les Mislerebles / Srbija

### Can you feel the spill?, društvena igra, video prezentacija (2013).
### Rad je nastao u okviru Nida umetničke kolonije u Litvaniji.

Can you feel the spill? je politička igra koncipirana u dva medija: kao društvena igra (board game) i kao lokativna android aplikacija. Cilj igre je očistiti naftnu mrlju nastalu na na Kravtsovskoye naftnoj platformi izgrađenoj u blizini područja pod UNESCO - vom zaštitom. Can you feel the spill? se bavi stvarnim socio - ekonomskim posledicama koje nastaju usled havarije na naftnoj platformi kao i ekološkim posledicama izgradnje naftne platforme u blizini područja bogatog biodiverzitetima. Poigravajući se ironizacijom odnosa moći vezanih za izgradnju naftne platforme i posledicama naftne mrlje, igra Can you feel the spill? formuliše jasan stav u odnosu na političke borbe, uticaj kapitala i generalne odnose struktura moći formirane kapitalističkim društvenim uređenjem i problematizovane ekstrakcijom

crnog zlata - nafte. Les Mislerebles je neformalna umetnička grupa / zajednica i pokret iz Srbije koja je posvećena stvaranju upotrebom digitalnih igri za društvene promene. Les Mislerebles koriste mikro - političke i mikro - socijalne prakse , nove solidar- nost , dok u isto vreme primenjuju nove estetske i analitičke metodologije da podstakne nove / alter- nativne subjektivitete. Radeći sa društvenim igrama i / ili digitalnim navigacionim aplikacijama, Les Mis- lerebles prave subverzivne igre koje se poigravaju sa očekivanjima igrača.

## Jan Lemic / Nemačka

*Mašina za registrovanje,* arhivski printovi (2013).

*Mašina za registrovanje* je dugoročni istraživački projekat o uticaju izgradnje *Eurotunnel* na stvarnom i vizuelnom pejzažu koji ga okružuje. Mašina za registrovanje sakuplja fotografije iz brojnih arhiva u Kaleu, severnoj Francuskoj. Istorija tunela ispod La Manša je kroz apstraktne tehničke detalje izrečena u neshvatljivoj lepoti. Izvedeno delo istražuje metaforične dimenzije uticaja mašinerije, teh- nologije i građevinarstva kao i dramatičnu promenu pejzaža koja iz nje proizilazi.
Prvobitno dizajniran da olakša tehnički detalj, omogući prolaz, funkcija tunela ispod Lamanša se pretvorila u svoju potpunu suprotnost – barijeru, funkcionišući sredstvima složenog sistema opozici- ja koje postaju vidljive na fotografijama.
Jan Lemic radi kao vizuelni umetnik sa pozadinom u fotografiji. Diplomirao je Istraživanje arhitekture na Goldsmiths univerzitetu 2011. Tematski se fokusira na pejzaže i arhitekturu. Jan Lemic je redovno izla- gao u Evropi i šire, uključujući i doprinose Glasovi mora Muzeju de Beauk - umetnosti de Kale, pamet savremenima u Berlinu, F - stop festivalu u Lajpcigu,

izložbama u Južnoj Koreji i tokom Međunarodnog Foto festivala u Singapuru.

## Džoana Mol / Španija

*AZ : Pomeriti se i biti upucan,* Instalacija (2012).

*AZ : Pomeriti se i biti upucan* je Internet rad koji očima šest sigurnosnih kamera prikazuje tokove kretanja, životinja i ljudi u pejzažu američko meksičke granice države Arizone.

Ove kamere su deo online platforme koju je napravila grupa zemljoposednika sa posedima na američkoj granici. Platforma prikazuje slike šest sigurnosnih kamera smeštenih na graničnoj terito- riji. Glavna svrha ove zajednice je pružanje javnosti uvid u nemontirane slike imigranata koji ilegalno prelaze granicu preko njihove zemlje. Svaka kam- era sadrži senzore za pokret, koji pokreću proces fotografisanja u slučaju kada opaze i najmanje vi- bracije u okolini. Tada, se ove slike šalju na server i prikazuju direktno na web stranici. Rad je sastavljen od šest nezavisnih filmova koje je automatski snimila svaka kamera. Svakih 24 sata, skript detektuje da li je bilo novih slika. Ove nove slike se čuvaju na loka- lnom serveru i algoritamski se dodaju odmah nakon poslednjeg kadra odgovarajućeg videa. Filmovi na ovaj način svakodnevno proširuju i otkrivaju tempo i prirodu kretanja u graničnom pojasu Arizone.
Džoana Mol je završila master studije iz digitalne umetnosti na univerzitetu Pompeu Fabra i osnovne studije vizuelnih umetnosti u Barseloni. Internacio- nalno je izlagala svoje radove i doprinela je razvoju interaktivnog projekta za muzej nauke u Granadi, Institut za Paleontologiju u Sabadelu i Univerzitetu Pompeu Fabra u Barseloni, i aktivno sarađuje sa transdisciplinarnim istraživačkim projektom „Trans-

formacija granica u 21. veku" u ImeRA, Marsej (Francuska).

## Šinseungbak Kimjonhun / Južna Koreja

*Lice oblak*, **Pigmentna Inkjet štampa na pamučnom papiru 200 cm x 80 cm (2012).**

Čovek vidi figure u oblacima: životinje, lica, pa čak i Boga. Ova vrsta percepcije takođe se pojavljuje u kompjuterskoj viziji . Algoritmi za prepoznavanje lica ponekad pronalaze lica koja to nisu. To je zato što čovekovo znanje o licu i razumevanje mehanizama ljudskog vida utiče na razvoj kompjuterskog vida. *Lice Oblak* je kolekcija slika oblaka koje je algoritam za prepoznavanje lica prepoznao kao ljudsko lice. To je rezultat greške računarskog vida, ali oni izgledaju kao lica takođe i za ljudsko oko. Ovaj rad pokušava da ispita odnos između računarskog i ljudskog vida. U ovom kontekstu koncept „autonomije" se odnosi na autonomiju koda i nivo samostalnosti algoritma. Šinseungbak Kimjonhun je umetnička grupa koja radi u Seulu, a sastoji se od Šin Seung Bak i Kim Jon Hun.Njihova zajednička praksa istražuje širi prostor snimanja i vizije koristeći kompjutersku obradu slike i kompjutersku viziju.

## Matias Tarasievic/ Austrija (u saradnji sa Maksom Gurešom i Damjan Stevart)

*Bitcoin oblak*, **Interaktivna instalacija 2m x 2m x 2m**

*Bitcoin oblak* je interaktivna instalacija i reaktivna skulptura koja tematizuje umetničku produkciju kao i alternativne ekonomije. Bitcoin oblak prikazuje direktni odnos priznanja i vrednosti sculpture:

što više gledalaca vidi umetničko delo, vrednost se povećava (bukvalno): takođe radi i  kao tzv. "Rudarska oprema" modifikovani računari koji proizvode "Bitcoin", valutu p2p zajednice. Trenutna vrednost sculpture je definisana brojem gledalaca koji gledaju umetničko delo (praćenih detektorom pokreta). U slučaju većeg kretanja oko umetničkog dela, ono proizvodi više Bitcoin-a.

Ova skulptura je interfejs koji tematizuje diskurs tržišta novomedijskih umetničkih dela. Isključujući se iz aktuelnog umetničkog tržišta, ono stvara sopstvenu logiku dok je u isto vreme sposobna da direktno poveže pažnju gledalaca sa sopstvenom izračunatom vrednošču.

Matias Tarasievic (tzv. parasew) je suosnivač grupe 5uper.net i CODED CULTURES iniciacije (umetnički medijski festival i  istraživačka platforma). Tokom poslednjeg milenijuma aktivan je kao brikolažer, koder, istraživač i teoretičar tehnologija, razvija eksperimentalne medijske prototipove i stvara projekte koji se nalaze na  preseku između medija, umetnosti, tehnologija i nauke. Vođa je projekta "Umetničke tehnologije istraživačke laboratorije" na univerzitetu primenjenih umetnosti u Beču u Austriji.

## Vonbin Jang  / SAD

*Serije vrsta*, **Mix media i video (2012/13).**

*Serije vrsta* kroz život njegovih robotskih stvorenja, istražuje njihove istorije nastanka, adaptacije, evolucije i skrivene dimenzije gradskog ekosistema. Serija veštačkih živih formi kao što su autonomni kinetički objekti i robotska bića stvorena su da rađaju, žive i umru u različitim sredinama. Bića su stvorena od neorganskih (neživih) komponenti. Poseduju sopstvene karakteristike i ponašanja  koja potiču od iščašenih i redefinisanih bioloških/zooloških koncepata umetnikove sopstvene vizije života. Njegova

bića evoluiraju u različitim pravcima, pod uticajem različitih urbanih krajeva i zajednica. On prati svaku jedinstvenu istoriju pojavljivanja, prilagođavanja i evolucije svakog bića i posmatra kako ljudi i naša društva reaguju na ove tuđine i strance.

Vonbin Jang je završio master studije iz Umetnosti i tehnologija u školi za umetnosti, Čikago Institut 2012. Jang je izlagao svoje projekte internacionalno u Nemačkoj, Japanu, Koreji i Americi. Dobio je nagrade „New Face nagrada" na 16-om festivalu Japanska medijska umetnost (2013), 'Publikumspreis' u Begehungen umetničkom festivalu (2012), 'James Nelson Raymond stipendija' na SAIC MFA takmičenju za stipendije (2012).

## Šu Li Čeng (SAD/FR)

**Seeds Underground party (2013).**
www.seedsunderground.net

*Seeds underground* je žurka na kojoj se razmenjuju sorte semena i šire podzemnim putevima. U nekim delovima sveta, genetski modifikovani usevi su kolonizovali ogromne farme (pšenica, soja, žitarice… ). Uvedena pre 30 godina, transgena biotehnologija je u međuvremenu komercijalizovana patentom zaštićenim od strane korporativnog sektora. Preuzimajući vlast nad većim marketima i pijacama, herbicidi – tolerantni na štetočine i otporna semena, obećavaju veće prinose i zaradu bez mnogo ekoloških problema. Evropska unija se sprema da usvoji novu politiku semena, koja se zalaže za seme industrijskih korporacija čime sva semena postaju predmet stroge regulacije. Strahuje se da će to naškoditi organskim sortama i sprečiti razmenu semena za poljoprivrednike i one koji čuvaju semena. Žurka *Seeds underground* poziva na socijalni aktivizam i stvara mesto za akciju, razmenu semena

poteklih pravo iz bašta, malih gradskih vrtova itd. Republika Srbija se priprema za pregovore o pristupanju EU, i važan segment pregovora bi upravo trebala da bude i semenska politika, posebno GM semena.

Poruka glasi:

Donesite vaša semena svih sorti koje ste požnjeli ili nabavili! Prijavite se za trgovinu semenima, da pratite njihovo prilagođavanje, klijanje i distribuciju. Donesite svoju muziku, pojačajte zvuk i razmenjujte semena tokom žurke! Otpor monopolizujućim tendencijama velikih proizvođača semena!

Producent: Institut za fleksibilne kulture i tehnologije – Napon
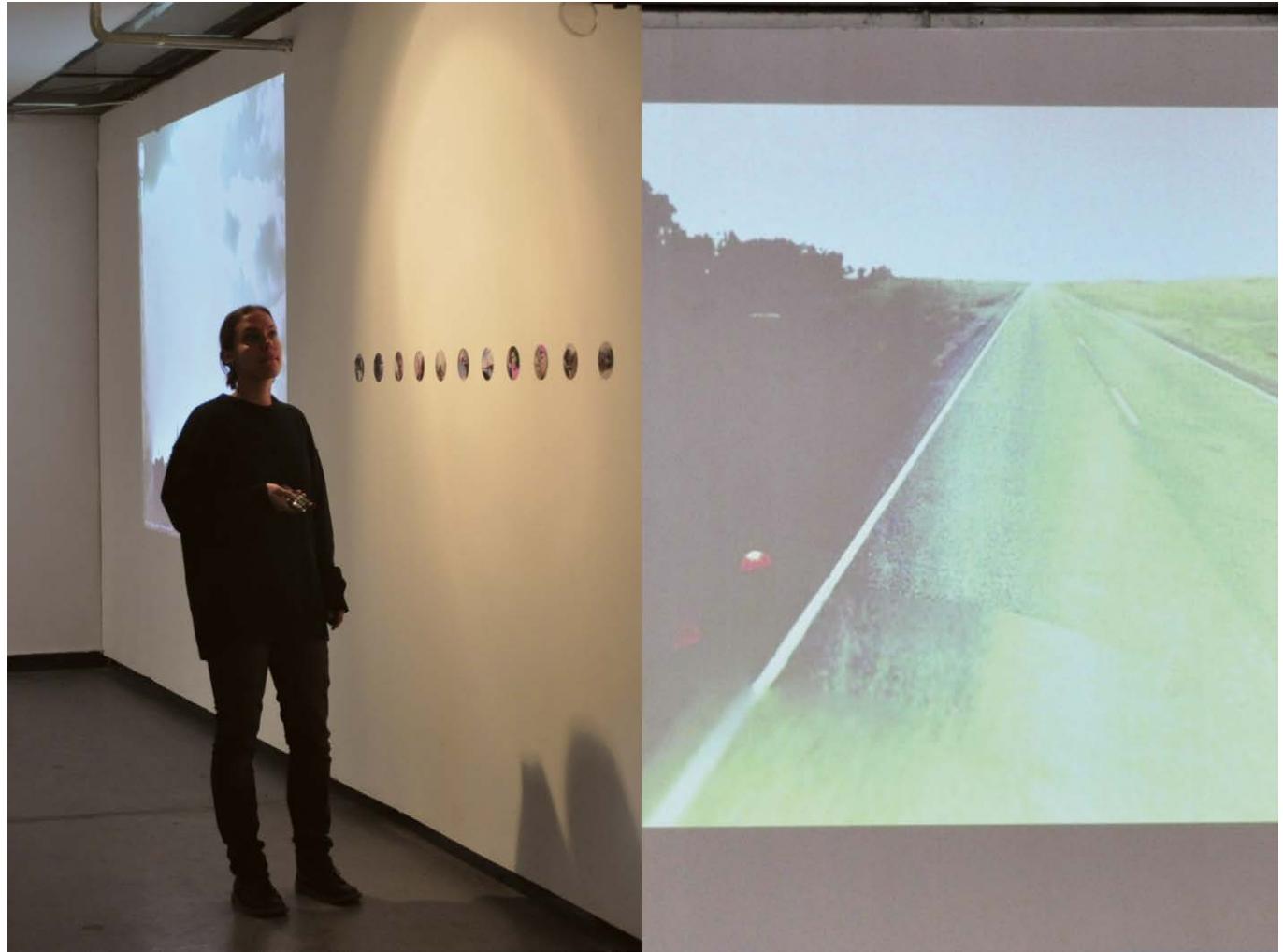
**Emilio Vavarela / Italija**

*Prijavi problem,* jednokanalna video projekcija; 07':35" Boja. Bez zvuka. Bez prevoda. (2012).

*Vozači i kamere,* štampa arhivskih fotografija na fotopapiru, 11 elemenata, 10cm (2012).

**Emilio Vavarella / Italy**

*Report a Problem,* One channel video projection; 07':35" Colors. No audio. No subtitles. (2012).

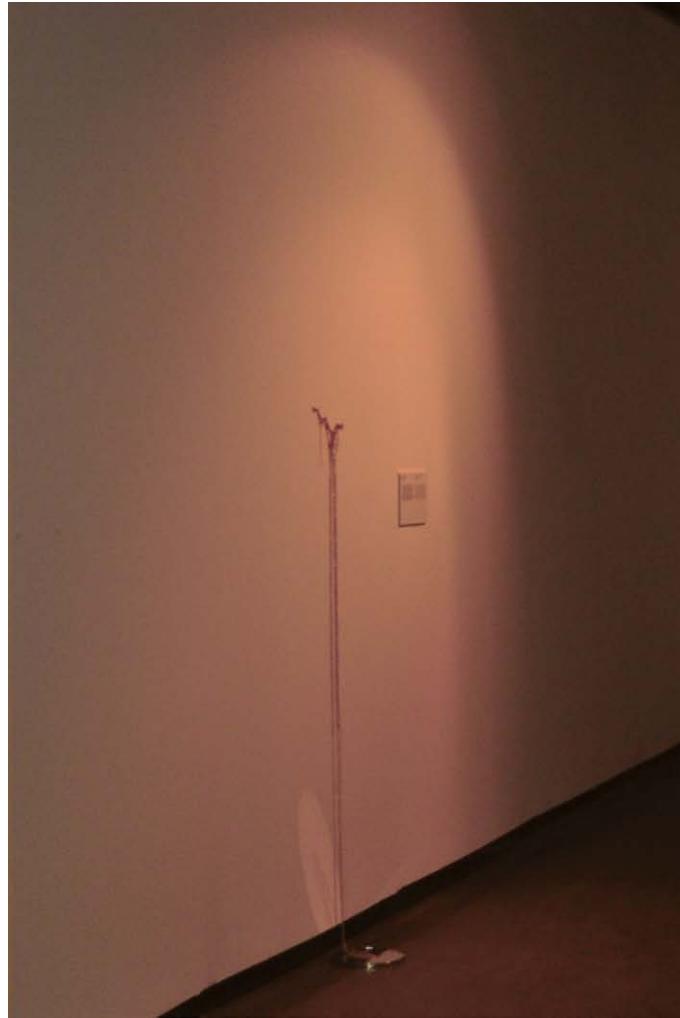*The Driver and the Cameras,* Archival inkjet print on photographic paper. 11 elements 10cm (2012).

**Darija Medić / Srbija**

*Into the blind-Model 300*, softverska umetnost, video (2012).

**Darija Medić / Serbia**

*Into the blind-Model 300*, software art, video presentation (2012).

**Džerardina Juarez / Švedska**

*Fleš kreš*, Instalacija, (2013).
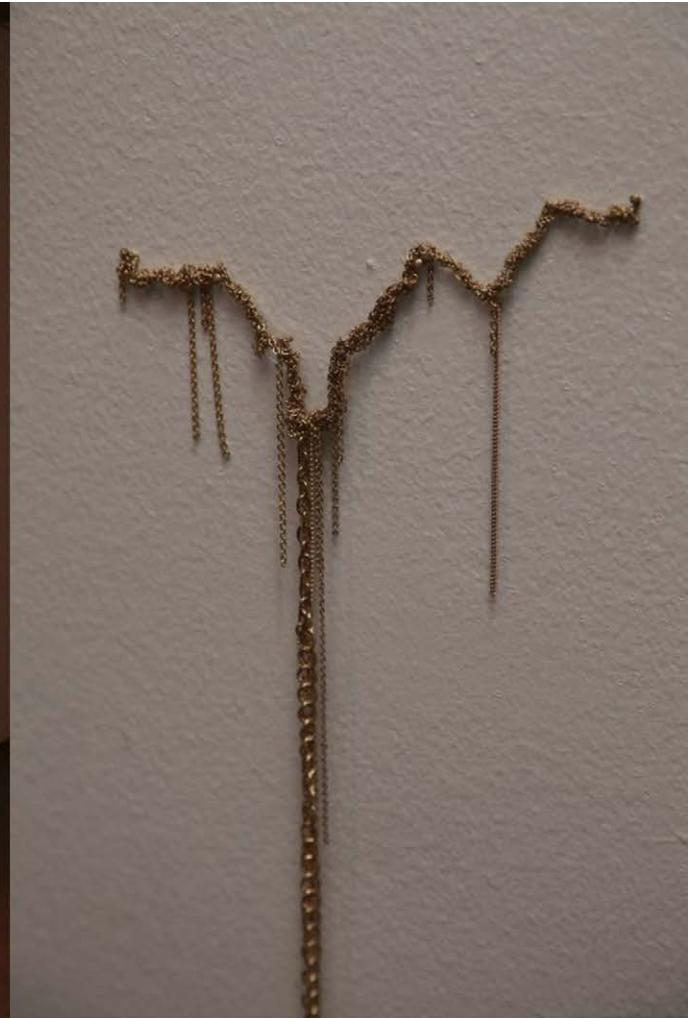
**Geraldine Juarez / Sweden**

*The Flash Crash,* Installation, (2013).

**Hit Bunting / Velika Britanija**

*Parabole automatskog novca*, print (2013).

**Heath Bunting / UK**

*Parables of automatic money,* print (2013).
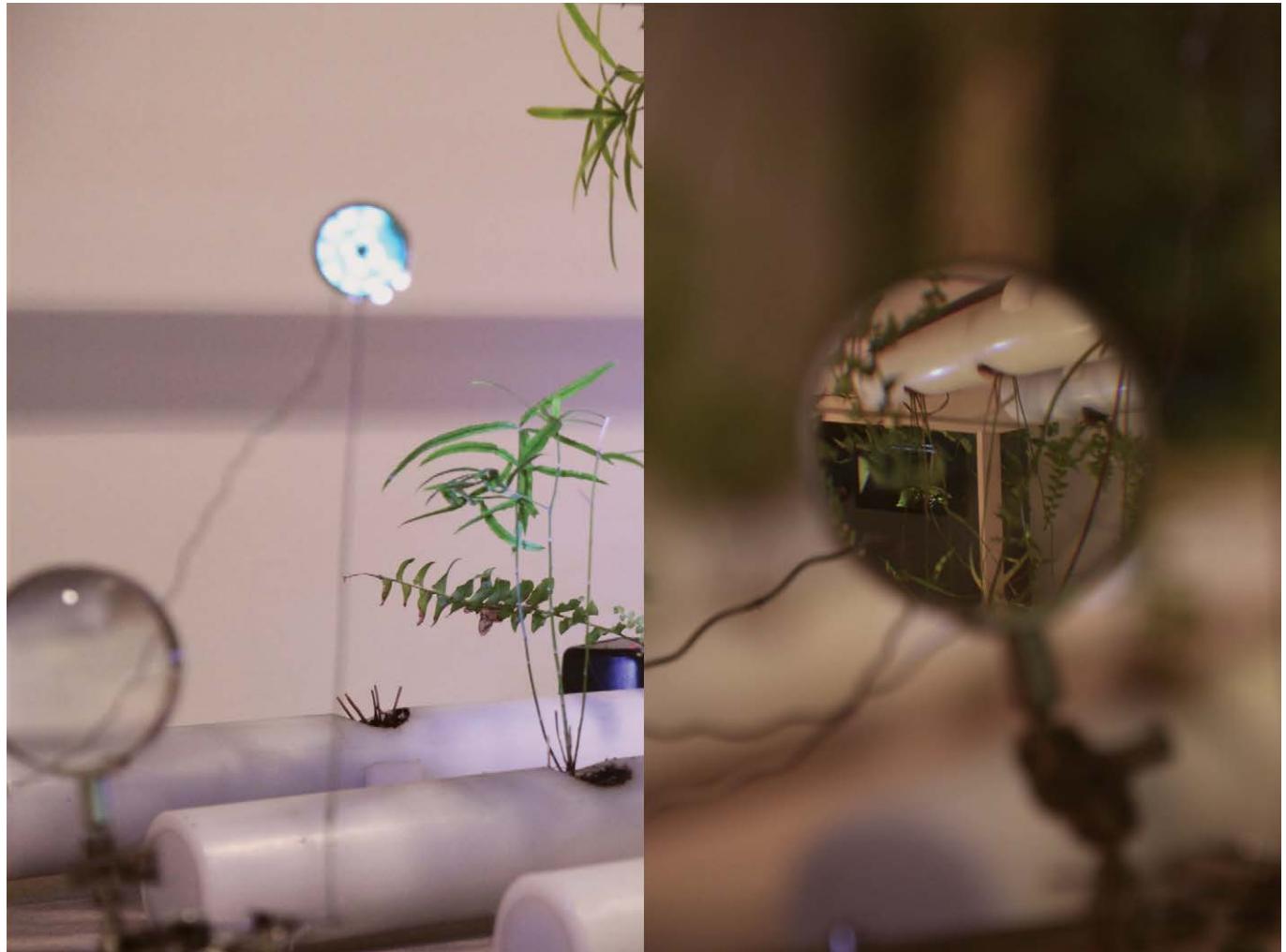
**Stevan Kojić / Srbija**

*The Lost Treasure*, instalacija, (2013).

**Stevan Kojić / Serbia**

*The Lost Treasure*, installation, (2013).

**Zvonko Gorečan / Srbija**

*RGB*, video projekcija (2013).

**Zvonko Gorečan / Serbia**

*RGB*, video projection and mix media (2013).

**Les Mislerebles / Srbija**

*Can you feel the spill?*, društvena igra, video prezentacija (2013).
Rad je nastao u okviru Nida umetničke kolonije u Litvaniji.

**Les Mislerebles / Serbia**

*Can you feel the spill?*, The bord game, video presentation (2013).
Created within Nida Art Colony in Lithuania.

**Jan Lemitz / Nemačka**

*Mašina za registrovanje,* arhivski printovi (2013).

**Jan Lemitz / Germany**

*The Registration Machine,* archived prints (2013).

**Džoana Mol / Španija**

AZ : Pomeriti se i biti upucan, Instalacija (2012).

**Joana Moll / Spain**

AZ: Move and get shot, installation, (2012).

**Šinseungbak Kimjonhun / Južna Koreja**

*Lice oblak*, Pigmentna Inkjet štampa na pamučnom papiru 200 cm x 80 cm (2012).

**Shinseungback Kimyonghun / South-Korea**

*Cloud Face*, Pigment Inkjet Print on Cotton Rag Paper, 200 cm x 80 cm  (2012).
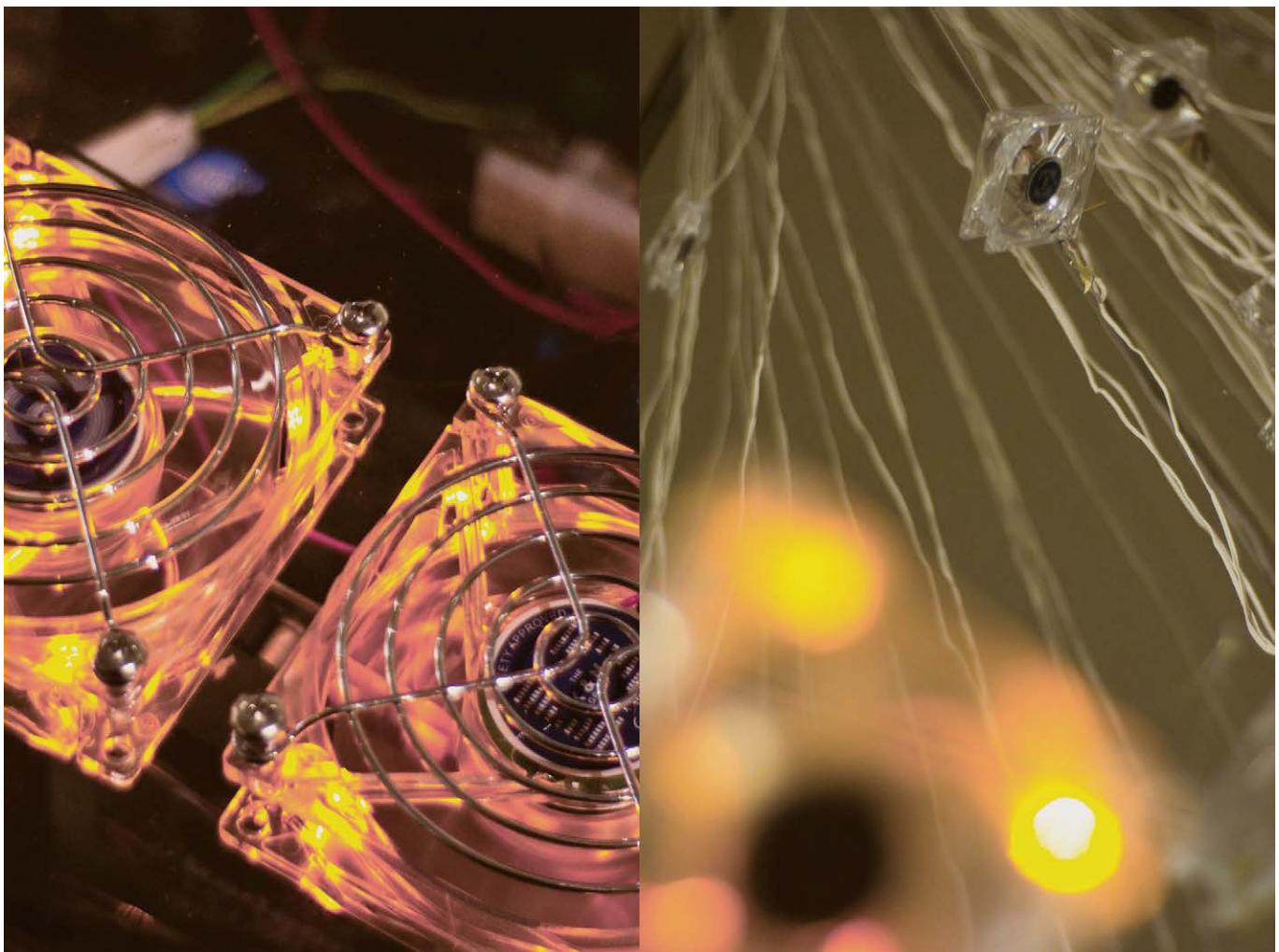
**Matias Tarasievic / Austrija
(u saradnji sa Maksom Gurešom i Damjan Ste-
vart)**

*Bitcoin oblak,* Interaktivna instalacja 2m x 2m x 2m

**Matthias Tarasiewicz / Austria
(in Cooperation with Max Gurresch and Da-
mian Stewart)**

*Bitcoincloud,* interactive instalation, 2m x 2m x 2m

**Vonbin Jang / SAD**

*Serije vrsta,* Mix media i video (2012/13).

**Wonbin Yang / USA**

*Species series,* Mixed media and video, (2012/2013).

**Šu Li Čeng (SAD/FR)**

*Seeds Underground party* (2013).
www.seedsunderground.net

**Shu Lea Cheang (USA/France)**

*Seeds Underground party* (2013).
www.seedsunderground.net

EXHIBITION

# Autonomies

7ᵗʰ – 28ᵗʰ November

*Museum of Contemporary Art Vojvodina*

*Dunavska 37*

Artists:

Darija Medić SRB

Emilio Vavarella IT

Geraldine Juarez SE

Heath Bunting UK

Jan Lemitz DE

Joana Mol ES

Les Mislerebles SRB

Matthias Tarasiewicz AT

Shinseungback Kimyonghun KR

Stevan Kojić SRB

Wonbin Yang USA

Zvonko Gorečan SRB

The exhibition *Autonomies* questions complex relations between technological development and ecosystem through artistic researches. The concept "autonomy" in this context primarilly means autonomy in the sphere of automatization and the levels of independence of algorithms and hardware bases. The concept of machinic autonomies is inevitably followed by the questioning of the human position in a machinized ecosystem and technocapitalistic order.

Technological development based on machine autonomy produced enthusiasm and fears, it is an emotional and theoretical battleground that endures to the present day. In parallel with these technical challenges, there is questioning of the independence of the autonomic system, its ethical position towards human, and its capacity to learn and improve. Regarding the relationship between society and technology, the concept of autonomy is most easily defined as a certain type of independence from management and, ultimately, independence from control. Transferring some crucial social, cognitive, and biological processes to machine intelligence

resulted in evident concerns for many people that such a scenario could take away the human decision making processes which once defined him/her as a social beings.

The efforts to make machines more independent from the environment, with the possibility of independent action in relation to man, have produced an increase in efficiency, human emancipation from alienating serial production (manufacturing, or later fordist), technological unemployment, and entirely new areas of ecological risks.

The question of machinic autonomies is filled with contemporary mythologies and realities. On one side there is a certain mystification of the algorithmic actor and the operations it executes in complex everyday operations, and on the other, a hesitation in society to confront the realities of an algorythmic ecosystem and its real world impact. In the world of financial algorythms this impact is maybe the most visible, although the very process of financial algorythmic operations is far from transparent.

The art works in the exhibition are chosen from those applied to call for works. They are mostly artistic researches of different phenomena such are HFT (high frequency trading), machinic glitches on examples of Google street view or face recognition software. Some works deal with autonomous systems of border monitoring, and some are dealing with how to avoid electromagnetic fields. An important part of the exhibition is focused on the relations between ecological and technological, from analyses of big technical systems and their permeation through local ecosystems, towards microecological interventions.

Concept:
Kristian Lukić, Sunčica Pasuljević - Kandić

Production:
Institute for Flexible Cultures and Technologies – Napon
www.napon.org

Co-production:
Institute for Culture of Vojvodina,
Museum of Contemporary Art Vojvodina

The exhibition is part of the international project *Techno-Ecologies* implemented by the Institute for Flexible Cultures and Technologies – Napon (Novi Sad) in partnership with: RIXC (Latvia) Baltan Laboratories (Netherlands), Ars Longa (France) and the Finnish Society BioArt (Finland).

Support:
Program EU Culture, the Ministry of Culture and Information of the Republic of Serbia, Autonomous Province of Vojvodina, City of Novi Sad.

## Emilio Vavarella / Italy

*Report a Problem,* One channel video projection; 07':35" Colors. No audio. No subtitles. (2012).

Emilio's work deals with autonomies sistems that are included in sistems of social control, such as Google corporation, by exploring aethetics of algoritmical errors. His work is showing that no technology or autonomus sistem, no matter how much it's powerful, is an ultimate technology without a place for error.

The series of 100 digital photos called *Report a Problem* is the first part of the project, *The Google Trilogy.* The Google Trilogy  is about the relationship between humans, power and technological errors. Report a Problem is the message that appears at the bottom of the Google Street View screen, which allows viewers to report a problem during the viewing of the place they are virtually visiting: missing censorship, wrong colors, random appearances. Work was created while the artist traveled on Google Street View photographing all the "wrong landscapes" he encountered before others could report the problems and prompt the company to adjust the images. Common landscapes are transformed by Google's unexpected technical errors into something new.

*The Driver and the Cameras,* Archival inkjet print on photographic paper. 11 elements 10cm (2012).

*Drivers and Cameras* is a second part of *Google trilogy* project. Each Google Street View car is equipped with a Dodeca 2360 camera with eleven lenses, capable of photographing 360 degrees. Afterwards the photos are assembled, creating a stereoscopic view, and an algorithm developed by Google automatically blurs the faces of people to protect the privacy of those accidentally portrayed. To create this series of photographs artist went looking for faces that had escaped Google Street View's algorithm. The eleven portraits he isolated immortalize the drivers of the Google car. The driver becomes a sort of phantom power; he appears where he shouldn't be and his presence escapes censorship. His face is the symbol of an error yet at the same time shows a human side and, perhaps, the limits of technological power.

Emilio Vavarella is italian artist who's artistic practice focuses on political philosophy and contemporary technological power with a particular emphasis on the aesthetics of error, subjectivity, mediated identity, biopolitics and social control. Through the use of new media he highlights the ambiguous spaces of power, such as unexpected errors and unpredictability. He is currently completing his M.F.A from Iuav University of Venice with a thesis on Error and Metamorphosis in New Media Art.

## Darija Medić / Serbia

*Into the blind-Model 300,* software art, video presentation (2012).

*Model 300* is a techno-psychological navigation experiment - a navigation device reflecting on the paranoid interpretations of technology, looking for routes of less electromagnetic frequency in urban spaces.

The concept "autonomy" in Darija's work is primarily oriented towards the autonomes sistems and their use for the benefits of the human health. During the process of altering the source code, the idea of the "shortest route" as in "the quickest way to solving a problem" became evident as a certain

foundation of programming. The technological development is goverend by institucional and social class dimensions, but Darija's work shows that we can use open sistems and technology for common good and be creative.

Darija Medić is a digital artist who, through the use of language, technology and design, investigates the realm of identity correction/theft/creation and the labyrinths of contemporary technological practices. In her activities she strives for autonomous forms of education and artistic practice as potentials for individual and social emancipation. She graduated from the networked media department at the Piet Zwart Institute, in Rotterdam, Netherlands and the new media department of the Academy of Arts in Novi Sad, Serbia.

## Geraldine Juarez / Sweden

### *The Flash Crash*, Installation, (2013).

Geraldine use markets as materials to deface the cultish nature of financial capitalism. The highly complex mechanisms of the market are always represented by the simplest possible image: A horizon; a simple line separating the earth from the sky.

*The Flash Crash,* is the fastest stock market crash to date, where the market crashed in seconds only to recover its losses minutes later. It was produced by high frequency trading algorithms. By playing with the cult-like nature of the market, this fake gold installation is an attempt to discover abundances and speak against the scarcity rhetoric promoted by economic liberalism. The concept "autonomy" in her work primarilly means autonomy in the sphere of automatization and the levels of independence of algorithms and hardware bases.

Geraldine Juarez is a mexican artist based in Sweden. She use technologies and piracies to interact with and reflect on the spaces, systems and situations that emerge when information, property and power clash. She also research, blog and publish texts about the endless tension between intellectual property law and copy cultures.

## Heath Bunting / UK

### *Parables of automatic money*, print (2013).

Starting with some money and using a variety of techniques to change state (location, social structure and possessions), an algorithm automatically follows the rules of The System to find methods for making more money.

Examples:
1. Buy a computer, start a company and open a bank account.
2. Buy a pen and apply for a credit card.
3. Buy a knife, make a pen, register with doctor, get a hazardous injection, get disabled and claim state benefits.
4. Buy a bus ticket, go and buy a computer and open a savings account.

Heath Bunting is a British artist based in Bristol, UK. His work focuses on the development of open democratic and communication systems and social structures on the Internet and in the public space. He aspires to be a skillful member of the public and currently training artists in survival techniques so they can out-live the organised crime networks during the final crisis. He is co-founder of net.art, co-founder of www.irational.org and has created many accredited works. Bunting's works have been commissioned and exhibited at a range of venues. He has lectured at many universities.

## Stevan Kojić / Serbia

*The Lost Treasure*, instalacija, (2013).

Project *The Lost Treasure* is based on the initiation of organic/techno-museological collection which is complied of fictive electronic waste (technological objects) and live organisms (bio-objects), allegedly found in the neighboring district. Bearing in mind the self-critical relation toward site-specific, in situ and eco-art practices and auto-ironical approach and engagement of the usual 'research methods', given space, historical, social, geo-political and techno-organic pieces of information are transformed into synthetic forms. Through subjective rendering of the environment, the possible/impossible condition in the parallel present or future is hypothetically hinted.  In the imaginary post apocalyptic age, discarded objects become active subjects of techno-organic structures within the new virtual worlds as a potential micro models  of futuristic megapolises.

Stevan Kojić graduated in 1997 with a BA in sculpture from the Faculty of Fine Arts, Belgrade and completed MA at the same Faculty in 1999. Since 2004 has been a Teaching Assistant and since 2008 is a Docent at the New Media Department of Academy of Arts in Novi Sad. He has paticipated in international simposiums, projects, group and solo exhibition in Europe and abroad. Kojic interest is in a private – public, low tech - high tech,  ecology - economy ect.

## Zvonko Gorečan / Serbia

*RGB*, video projection and mix media (2013).

Even with the reduction in use of fossil and nuclear fuels and increase of renewables which has been impossible only until recently we continue to pollute our enviroment. With this in mind artist continues to explore this subject outside of his main field of practice. His playful and colorful board game serves as a playground for audience to engage in the quest of finding the best way of using the energie that is available at the time.

Having finished the studies in power engineering, Zvonko Gorečan has been engaged in the research in the fields of system stability and system management – Smart Grid in particular. He is the author of several tens of papers and books in the mentioned fields. In his further work, he has directed his research activities towards deeper analysis of cultural practice related to various power system needs in different society parts or finding the benefits in the disbalance, which in relation with Information Technology, could create a more stable power system. Currently, he is hired as an leading expert on projects in advanced European Smart Grid companies (Italy, Denmark and Russia). He is a member of Eastwood – Real Time Strategy Group.

## Les Mislerebles / Serbia

*Can you feel the spill?,* The bord game, video presentation (2013).
Created within Nida Art Colony in Lithuania.

*Can you feel the spill?* is a political game designed in two media: a board game  and  locative Android application. The goal of the game is to clear the oil spill caused to the Kravtsovskoye oil platform built close to the area under the protection of UNESCO. Can you feel the spill? deals with the socio-economic consequences arising from possible accident on an oil rig and the environmental consequences of construction of oil platforms near an area's rich in biodiversity. Playing with ironic power relations connected to the construction of oil platforms and issues

and consequences of an oil spill, Can you feel the spill? formulates a clear position related to political struggle, impact of capital and general structure of power established in the capitalist social order and addressed by the extraction of black gold – oil.

Les Mislerebles is an informal artistic group/community and a movement from Serbia that is dedicated to creating/using /digital/ games for social change. Les Mislerebles are using micro-political and micro-social practices, new solidarities, while at the same time applying new aesthetic and analytically methodology to foster new/alternative subjectivities. Working with board games and/or digital navigation applications, Les Mislerebles are making subversive games that play with the player's expectations.

## Jan Lemitz / Germany

### The Registration Machine, archived prints

The Registration Machine is a long term research project on the impact of the construction of the Eurotunnel onto the actual and the visual landscape surrounding it. The Registration Machine brings together photographs from a number of archives in Calais, northern France. The history of the Channel Tunnel is told in incomprehensible beauty through abstract technical detail. The resulting piece explores the metaphorical dimensions surrounding the impact of machinery, technology and civil engineering as well as the dramatic change in the landscape that derive from it. Initially designed to facilit technical detail, enable a passage; the function of The Channel Tunnel has been turned into its complete opposite – that of a barrier, functioning by means of a complex system of oppositions that become visible in the photographs.

Jan Lemitz's work as a visual artist is informed by photographic practice. He graduated in Research Architecture from Goldsmiths College in 2011. Thematically he is focused on landscape and architecture. Jan Lemitz has exhibited in Europe and overseas on a regular basis, including contributions to Voices of the Sea at the Musée des Beaux-Arts de Calais, savvy contemporary in Berlin, the f-stop Festival in Leipzig, exhibitions in South Korea and during the Singapore International Photo Festival.

## Joana Moll / Spain

### AZ: Move and get shot, installation, (2012).

AZ: move and get shot is a net based piece which shows the natural, animal and human flows in the landscape of the U.S. / Mexico border in the state of Arizona, through the eyes of six surveillance cameras.

These cameras are part of an online platform created by a group of landowners with properties in the U.S. border. The platform shows the images of six surveillance cameras located in the border territory. The main purpose of this community is to provide the public with raw images of immigrants crossing the border illegally through their lands. Each camera incorporates a motion sensor, which triggers the capturing of images when detecting the slightest vibration of the landscape. Then, these pictures are sent to a server and displayed directly on the web page. The piece is composed of six independent films automatically made from the images captured by each camera. Every 24 hours, a script detects whether there are new pictures. These new images are saved to a local server and added algorithmically right after the last frame of the corresponding video. Thus, the films expand and reveal, day by day, the pace and the nature of the movement of the Arizona borderland.

Joana Moll holds a Master's degree in Digital Arts from the Universitat Pompeu Fabra and a BA in Visual Arts in Barselona. She exhibited internationaly and contributed to the development of interactive projects for the Science Museum of Granada, the Institute of Palaeontology of Sabadell and the Universitat Pompeu Fabra, in Barcelona, and is actively collaborating with the trandisciplinary research project 'The Transformation of Borders in the 21th Century' at IMéRA, Marseille (France).

## Shinseungback Kimyonghun / South-Korea

*Cloud Face,* **Pigment Inkjet Print on Cotton Rag Paper, 200 cm x 80 cm  (2012).**

Human sees figures in clouds: animals, faces and even god. This kind of perception also appears in computer vision. Face-detection algorithms sometimes find faces that are not. It is because human's knowledge of a face and understanding of human vision mechanisms affect the development of the computer vision.  *Cloud Face* is a collection of cloud images that are recognized as human face by a face-detection algorithm. It is a result of computer's vision error, but they look like faces to human eyes, too. This work attempts to examine the relation between computer vision and human vision. The concept "autonomy" in this context primarilly means autonomy of the code  and the levels of independence of algorithms.
Shinseungback Kimyonghun is a Seoul based media artist group consisting of Shin Seung Back and Kim Yong Hun. Their collaborative practice explores expanding area of imaging and vision using image processing and computer vision.

## Matthias Tarasiewicz / Austria (in Cooperation with Max Gurresch and Damian Stewart)

*Bitcoincloud*, **interactive instalation, 2m x 2m x 2m**

*Bitcoincloud* is an interactive media-arts installation and reactive sculpture thematizing artistic production as well as alternative economics. Bitcoincloud shows a direct relation of recognition and value of the sculpture: the more viewers watch the art-piece, the more its worth grows (literally): it also works as a so called "Mining Rig", modified computers that create the p2p community currency "Bitcoin".  The current value of the sculpture is defined by the amount of viewers watching the artpiece (tracked with a motion-detector). If more movement is taking place near the artwork, it creates more Bitcoins. This sculpture is an interface to thematize the discourse on the market for new media artworks. By excluding itself from the actual art market, it creates its own logic while still being feasible, directly connecting the attention of the viewers to its calculated value.
Matthias Tarasiewicz (aka parasew) co-founded the group 5uper.net and the CODED CULTURES initiative (media arts festival and research platform). Being active as a digital bricoleur / coder, researcher and technology theorist since the last millenium, he is developing experimental media prototypes and creating projects on the intersections of media, arts, technology and science. He is project lead of the "Artistic Technology Research LAB" at the University of Applied Arts in Vienna, Austria.

## Wonbin Yang / USA

*Species series,* **Mixed media and video, (2012/2013).**

*Species series* explores the hidden dimensions of city ecosystem through the life of robotic creatures and their histories of emergence, adaptation, and evolution. A series of artificial life forms such as autonomous kinetic objects and robotic creatures are created to have birth, life, and death in varying environments. The creatures are composed of inorganic(inanimate) components. They have own characteristics and behaviors originated from the twisted and redefined biological/zoological concepts in artist own vision of life. His creatures are evolving into various directions under the influence of different urban areas and communities. He trace each creature's unique histories of emergence, adaptation, and evolution while he observe how the people and our societies react to these aliens and strangers.

Wonbin Yang received an MFA in Art and Technology Studies from the School of the Art Institute of Chicago in 2012. Yang has been exhibited his projects internationally in Germany, Japan, Korea, and USA. He received awards including 'New Face Award' in the 16th Japan Media Arts Festival (2013), 'Publikumspreis' in Begehungen Art Festival (2012), 'James Nelson Raymond Fellowship' in SAIC MFA Fellowship Competition (2012).

## Shu Lea Cheang (USA/France)

*Seeds Underground party* **(2013).**
www.seedsunderground.net

*Seeds underground* is seed exchange parties where packets of seeds change hands and go underground in the fields across nation borders. In certain parts of the world, the vast farmlands have been colonized by genetically modified crops for our staple foods (i.e. wheat, soybeans, corns). Introduced 30 years ago, the transgenic biotechnology has since been commercialized by the patent-protected corporate sectors. Taking over the wholesale markets, the Herbicide-tolerant and pest-resistant seeds promise higher yields and profits without much ecological concerns. The European Union is about to adopt a new seed policy, which favors the seed industry corporations by making all seeds subject to strict regulation. It is feared that this will hurt organic varieties and prevent seed exchange by seed farmers and savers.

*Seeds underground party* calls for social activism while creating a place for action, exchange of seeds stemming straight from the garden, small urban gardens, etc. Republic of Serbia is preparing negotiation process with EU and important agenda in the negotiations is seed policy, and especially GMO seeds.

So the message is:

Bring your harvested, acquired seeds of sorts to this party! Sign on to trade seeds, to adopt and germinate, to broadcast and track their distribution. Bring your music, pump up the volume, exchange seeds while partying! Resist the monopolising tendencies of large seed producers!

Production: Institute for flexible cultures and technologies- Napon

# *Autonomies*

Through different research and representative forms, the project *Autonomies* has dealt with general automatization and autonomization for the last 3 years. Conceived as a research project, the goal at the beginning was to research the realities and mythologies of machinic (algorithmic) autonomies in different contemporary ontologies and ecologies. Discourse on autonomous machines is more and more a part of public concern, the discourse on machines that in some way overtake operations that were considered as human. During the project realization the goal was slightly modified to partly includ the general issues of the technological conditions of being and the problems of so called general ecology, an idea of manifold ecologies that were instigated by the crisis of anthropocentric discourse.

As a result of the first cybernetic utopias of the fifties and sixties, mostly in the USA, there was significant development of centers and laboratories that had artificial intelligence research as their agenda. At that time enthusiasm vanished after a while, mostly due to the complexity of the whole project, to create and make operative artificial intelligence (esp. so-called hard AI). After several *summers* and *winters*

in the development of artificial intelligence, some elements of artificial intelligence start to appear and be applied in wider uses. This wider application was possible due to long-term research and higher computation power and capacity. The concept of full automatisation and machinic autonomy was often mystified and mythologized, so the lack of success in achieving the set goals were welcomed by technodystopians and AI critics claimed that the whole idea is a bubble and basically impossible to be realized. At least in the way how techno enthusiast were imagining. On the other side, achievements in robotics, mechatronics and in the development of computer power resulted in certain steps that could be regarded as machinic autonomies. At the same time, the question appears, what are the social political, ecological and ontological results of technical development?

The idea of "Autonomies" in technized environment questions the (im)possibility of autonomies and basic dichotomy: on the one side, Wiener's cybernetic "connectivity", and on the other side Simondon's constant individuation. Texts in the publication are an overview of recent research in the field that might be called ontologies of technologized systems.

The key text in the publication is the one by Gilbert Simondon *Technical mentality* where he claims that technical object is not the case of historical causality but it is, as a technical innovation, autonomous and has absolute origin. Technical object is not the product of causality, but its own self-conditioned emergence.

Erich Hörl in the text Thousand ecologies is problematifing the concept of environmentalism and the multiplying of different ideas of ecologies, which he connects with ever growing technization and with "Being in the technological conditions". Also Hörl writes about Heidegger's problem of conceptualizing of cybernetic complexity of humans, life forms

and technologies, due to Heidegger's fundamental anthropocentric view (although he was a critic of humanistic discourse).

In the text *What You Resist Persists: Automation, Automatism and Autonomisation* Anthony Iles writes about autonomisation of the process of capital accumulation that runs parallel with autonomisation and technological automatization. He connects autonomisation with the division of labour in tailorism, when the division of labour and compartmentalisation of different level in production, becomes itself a method of mass production.

There are part of the book "Contagious Architecture: Computation, Aesthetics, and Space", namely "Cybernetic Thougth" and "Ecological Thought" from the chapter 3. "Architecture of Thought", in the publication included. Parisi in her book develops the idea that algorithmic computation is not only mathematical tool but specific mode of thought, which its abstraction and more and more complexity goes beyond human cognition. These models of thought, although instigated by human, have autonomous tendencies independently from human.

In the text *Mayhem in Mahwah The Case of the Flash Crash; or, Forensic Reperformance In Deep Time,* Gerald Nestler shows through many examples how automatized algorithms on stock exchanges limits the human factor not only in tactical decisions in buying and selling, but seriously limits retroactive investigation of algorithmic operations. Nestler writes about complexity of forensic travel to the micro past of stock exchange high frequency and ultra speed operations.

*Kristian Lukić*

# Technical Mentality[1]

This paper is not concerned with ontology but with axiology. It aims to show that there exists a technical mentality, and that this mentality is developing, and therefore incomplete and at risk of being prematurely considered as monstrous and unbalanced. It requires a preliminary attitude of generosity towards the order of reality that it seeks to manifest, because this incomplete genesis brings into play values that a general refusal [of this mentality] could condemn to ignorance and would risk negating.

We will try to show that the technical mentality is coherent, positive, productive in the domain of the cognitive schemas, but incomplete and in conflict with itself in the domain of the affective categories because it has not yet properly emerged; and finally, that it is without unity and is almost entirely to be construed within the order of the will.

**I Cognitive Schemas**

The theoretical domain was the first to emerge in Western civilizations, the first to have been theorized, systematized, and formalized. It has lead to productive constructions and it presents in itself a method of discovery and interpretation that can be generalized. In this sense, the technical mentality offers a mode of knowledge *sui generis* that essentially uses the analogical transfer and the paradigm, and founds itself on the discovery of common modes of functioning--or of regime of operation--in otherwise different orders of reality that are chosen just as well from the living or the inert as from the human or the non-human.

Leaving Antiquity[2] aside, technology has already yielded in at least two ways schemas of intelligibility that are endowed with a latent power of universality: namely, in the form of the Cartesian mechanism and of cybernetic theory.

In the Cartesian mechanism, the fundamental operation of the simple machine is analogous to the functioning of logical thought capable of being rigorous and productive. A simple machine is a transfer system that, in the particular case in which the movement is presumed to be reversible, in the state of equilibrium, establishes the identity of a work that puts into motion and a work that resists. If each piece of the machine carries out this transfer rigorously, the number of pieces can be whatever; what changes is merely the direction of forces-as with the pulley--or the factors (force and movement) of a product that remains constant, as in the case of the pulley-blocks. The rational mental process returns the essence of the customary technical objects to this transfer schema: a chain is an enchainment of links, with the second link being fixed to the first just as the first is fixed to the anchoring ring. The transfer of forces goes from link to link, so that if each link is welded well and there are no gaps in the enchainment, the last link is fixed to the anchoring point in a more mediated but also more rigorous way than the first. A building, stone upon stone, row upon row, in a transfer of the "certum quid et inconcussum",--the resistance of the stone of the foundations--all the way to the top, through successive levels that each act as the foundation for the immediately following higher level.[3] This intelligibility of the transfer without losses that mechanizes ideally and analogically (but also in reality, by virtue of the Cartesian conception of knowledge) all the modes of the real, applies not only to the RES EXTENSA but also to the RES COGITANS: the "long chains of reasons" carry out a "transport of evidence" from the premises to the conclusion, just like a chain carries out a transfer of forces from the anchoring point to the last link. The rules of the method are not only inspired by mathematics; they are also perfectly conform to the different stages of fabrication and technical control. Thought needs an anchoring point that is the operative equivalent of the stone under the building, or of the ring that is attached to the origin of the chain: *certum quid et inconcussum*: it is evident what remains after all attempts at deconstruction, even after hyperbolic doubt. The conduct of reasoning requires an analysis--a division of the difficulty in as many parts as possible and as needed in order to better solve the difficulty--because each piece of the intellectual montage must play a simple, univocal role--like a pulley, a lever of which the mechanical function in the whole is simple and perfectly clear. The third rule (of the synthesis or the order) is the arrangement according to the schema of the completely unified whole of the machine. Finally, the fourth rule, that of control, is the unification of the placement of the different pieces and the adaptation of the machine as a whole to the two realities at both ends of the chain.

What is carried out in both the rational study of machines and in the conduct of thought is the *transfer without losses*: science and philosophy are possible because the transfer without losses is presumed to be possible. Consequently, the only domains that are accessible to philosophical reflection are those with a continuous structure. It will therefore be clear why one has wanted to consider living beings as machines: if they weren't machines *ontologically*, they would have to be so at least *analogically* in order to be objects of science.

Cybernetics, which was born from the mathematisation of the automatic regulation apparatuses [dispositifs]- particularly useful for the construction of automatic equipment of airplanes in flight-introduces into this the recurring aim of information on a relay apparatus as the basic schema that allows for an active adaptation to a spontaneous finality. This technical realization of a finalized conduct has served as a model of intelligibility for the study of

a large number of regulations--or of regulation fail-ures--in the living, both human and nonhuman, and of phenomena subject to becoming, such as the species equilibrium between predators and preys, or of geographical and meteorological phenomena: variations of the level of lakes, climatic regimes.

In this sense, technology manifests in successive waves a power of analogical interpretation that is *sui generis;* indeed, it is not hemmed in by the limits of repartition of essences or of domains of reality. It does not take recourse to categories, leaves aside generic relations, special relations, and specific dif-ferences. None of the schemas exhausts a domain, but each of them accounts for a certain number of effects in each domain, and allows for the passage of one domain to another. This transcategorical knowledge, which supposes a theory of knowledge that would be the close kin of a truly realist idealism,[4] is particularly fit to grasp the universality of a mode of activity, of a regime of operation; it leaves aside the problem of the atemporal nature of beings and of the modes of the real; it applies to their function-ings; it tends towards a phenomenology of regimes of activity, without an ontological presupposition that is relative to the nature of that which enters into activity. Each of the schemas applies only to certain regimes of each region, but it can in principle apply to any regime of any region.

The application of such schemas of intelligibility re-quires two main conditions, which can be presented as postulates of the "technical mentality":

1. *The subsets are relatively detachable from the whole of which they are a part*. What technical activ-ity produces is not an absolutely indivisible organ-ism that is metaphysically one and indissoluble. The technical object can be repaired; it can be complet-ed; a simple analogy between the technical object and the living is fallacious, in the sense that, at the moment of its very construction, the technical ob-ject is conceived as something that may need con-trol, repair, and maintenance, through testing, and modification, or, if necessary, a complete change of one or several of the subsets that compose it. This is what one calls anticipated "maintenance," to use the Anglo-Saxon term.

This postulate is extremely important when one questions the way in which one can engage with a living being, a human being, or an institution. The holistic postulate, which is often presented as an at-titude of respect for life, a person, or the integrity of a tradition, is perhaps merely a lazy way out. To accept or reject a being wholesale, because it is a whole, is perhaps to avoid adopting towards it the more generous attitude: namely, that of careful ex-amination. A truly technical attitude would be more refined than the easy fundamentalism of a moral judgment and of justice. The distinction of the sub-sets and of the modes of their relative solidarity would thus be the first mental work that is taught by the cognitive content of the technical mentality.[5]

2. The second postulate is that of the levels and the regimes: *if one wants to understand a being com-pletely, one must study it by considering it in its ent-elechy, and not in its inactivity or its static state*.

The majority of technical realities are subject to the existence of a threshold to start up and to maintain their own functioning; above this threshold, they are absurd, self-destructive; below it, they are self-sta-ble. Very often, the invention consists in supposing the conditions of their functioning realized--in sup-posing the threshold problem resolved. This is why the majority of inventions proceed by condensation and concretization, by reducing the number of prim-itive elements to a minimum, which is at the same time an optimum.[6]

Such is the case, for example, with the stato-reac-

tor of Leduc: on the ground, it is merely an absurd structure, incapable of providing a push in a determinate direction: but starting from a certain speed of movement, it becomes capable of maintaining its speed--in other words, its pushing forward--and of furnishing a usable energy of movement.The GUIMBAL group--which is held entirely in the forced conduct of a dam--originally seemed absurd. The alternator is of such small dimensions that it seems that the armature must be destroyed by the Joule effect. But it is precisely this small dimension that allows for the alternator to be lodged completely within the canalization, on the turbine axis itself. This ensures a cooling that has a considerably greater effect than that of an alternator placed in the air. This disposition is made possible by putting the alternator in a casing filled with oil, which heightens the isolation and improves the thermal exchanges, all the while ensuring the lubrication of the different levels and preventing water from coming in: here, the multifunctional character of the oil of the casing is the very schema of concretization that makes the invention exist, as a regime of functioning.

Analogically, it is possible to anticipate the existence, within different orders of reality, of certain *effects* (used here as in the expressions "the Raman effect," "the Compton effect") that for their existence require determinate thresholds to be crossed. These effects are not structures; they are different from these structures in that they require the threshold to be crossed. An internal combustion engine that is turned off is in a stable state and cannot turn itself on; it needs a certain amount of energy coming from outside, it needs to receive a certain angular speed in order to reach the threshold of self-maintenance, the threshold beyond which it functions as a regime of automatism, with each phase of the cycle preparing the conditions of completion for the following phase.

From these few observations, we can conclude that the technical mentality already offers coherent and usable schemas for a cognitive interpretation. With the Cartesian mechanism and cybernetics, it has already yielded two movements of thought; but in the case when there is an awareness of the systematic use of the two postulates presented above, it also appears to be capable of contributing to the formation of larger schemas.

## II Affective Modalities

The picture is much less clear, however, as soon as one tries to analyze affective contents. In this case, one encounters an antagonism between the artisanal and the industrial modalities, an antagonism that is paired to an impossibility of completely separating these two aspects. The craftsman's nostalgia traverses not only the industrial life of production, but also the different daily regimes of the consumption of goods coming from the industrial world.

It is difficult to return a bundle of perfectly coherent and unified traits to the opposition between the artisanal and the industrial modality when one wants to account for the genesis of affective modalities. However, we will propose a criterion that, after several attempts, seemed to be the least problematic: in the case of the craftsman, all conditions depend on the human being, and the source of energy is the same as that of information. The two sources are both in the human operator; there, energy is like the availability of the gesture, the exercise of muscular force; information simultaneously resides in the human operator as something learned, drawn from the individual past enriched by education, and as the actual exercise of the sensorial equipment that controls and regulates the application of the learned gestures to the concrete materiality of the workable material and to the particular characteristics of the

aim [of the work]. The manipulation is carried out according to continuous schemas on realities that are of the same scale as the operator. Correlatively, the distance between the act of working and the conditions of use of the product of the work is weak: the shoemaker has directly taken the measurements, the saddler knows for which horse he is working; recurrence is possible: the speed with which the object wears off, the types of the deformation of the product during usage are known to the craftsman, who does not only construct but also repairs.

Moreover, in the case of the craftsman the relation between the Human Being and Nature is immediate, because it lies in the choice of the materials and of the work that is done on them. In the artisanal modality, work is artifice, it orders and makes act differently workable materials that are almost primary materials, but that remain close to the natural state, like leather or wood. Artisanal work is generally not preceded by a complete transformation of these primary materials. The latter would require the investment of sources of energy taken from outside of the human body. In this sense, such a transformation comes--even in the pre-industrial state-from an industrial schema, namely that of metallurgy, which is industrial through the transformation of the mineral into metal, even if it remains artisanal because of the way it produces objects.

The industrial modality appears when the source of information and the source of energy separate, namely when the Human Being is merely the source of information, and Nature is required to furnish the energy. The machine is different from the tool in that it is a relay: it has two different entry points, that of energy and that of information. The fabricated product that it yields is the effect of the modulation of this energy through this information, the effect that is practiced on a workable material. In the case of the tool, which is handheld, the entry of energy and the entry of information are mixed, or at the very least partially superimposed. Of course, one can guide the chisel of the sculptor with one hand, and push it with the other, but it is the same body that harmonizes the two hands, and a single nervous system that appropriates their movement into such detail from the material and for the set aim. The potter's work, which is moved by his feet, is still of the same kind, but it allows one to anticipate the birth of the machine. Glass-making is artisanal insofar as the glass-maker furnishes the energy that dilates the initial bubble by blowing, and insofar as he regulates through the rhythm of his blowing the speed of the plastic deformation of the glass. But it becomes industrial when the energy is borrowed from a compressor.

When he borrows energy from a natural source, the human being discovers an infinite reserve, and comes to possess a considerable power. For it is possible to set up a series of relays, which means that a weak energy can lead to the usage of considerable energies.[7]

Unfortunately, the *entry of information* that comes into the work is no longer unique in the way it is with the artisanal gesture: it happens through several moments and at several levels. It takes place a first time with the invention of the machine--an invention that sometimes implies the bringing into play of considerable zones of knowledge and the gathering of a large number of human beings. It happens a second time with the construction of the machine and the regulation of the machine, which are modes of activity that are different from the machine's usage. Finally, it happens a third and a fourth time, first in the learning to work with the machine, and then in the machine's usage. Whereas the machine constitutes a complete technical schema, as the relation of nature and the Human Being, as the encounter of an information and an energy operating on a material,

none of the four moments of information contribution is organically linked to and balanced out by the others. The act of information contribution becomes dissociated, it is exploded into separate moments taken on by separate individuals or groups. In order for the craftsman to recognize his equivalent in the industrial modality, the same human being must be inventor, constructor, and operator. However, the effect of this amplification and complication of the industrial world is to spread out the different roles from each other: not only the source of information from the source of energy and the source of primary material, but even the different tasks of information contribution. It is thus a weaker part of the total capacities of the human being that is engaged in the industrial act, both when s/he is operator and in the other roles of information contribution. The iterative and fragmentary regime of the task of the operator in industrial production is an "anatomy of work"[8] that provokes different effects of industrial fatigue. But it is also exhausting to have only invention as a task, without also participating in construction and operation. The figure of the unhappy inventor came about at the same time as that of the dehumanized worker: it is its counter-type and it arises from the same cause. To put itself at the dimension of the machine's energy entry, the information entry complicates itself, becomes divided and specialized, with the result that the human being is not only isolated from nature[9] but also from himself, and enclosed in piecemeal tasks, even as inventor. He thus encounters the discontinuous through work.

However, trying to return to directly artisanal modes of production is an illusion. The needs of contemporary societies require not only large quantities of products and manufactured objects, but also states that cannot be obtained by means of the human body and by the tool. This is because the temperatures, the pressures, the required physical reac-

tions, the scale of the conditions do not match those of human life. The workplace, on the other hand, is a *human environment.*

It is in this very emphasis on industrial production, in the deepening of its characteristics that an overcoming of the antithesis between the artisanal modality and the industrial one can be studied with a greater likelihood of success. And this not only generally and superficially but by means of what, within the industrial organization of the production, has pushed to its extreme limits the specialized fragmentation of human information contribution: the rationalization of work through a series of methods of which Taylorism was the first.

### III. Volunt ary Action: A Study of Norms

But we must cut short here the consideration of the affective modalities in order to investigate norms of voluntary action, and thus to complete this construction of the technical mentality. Indeed, the technical mentality can be developed into schemes of action and into values, to the point of yielding a morality in human environments that are entirely dedicated to industrial production. But insofar as these environments remain separated from the social field of the usage of products, insofar as they themselves remain fragmented into several specialized groups by their different functions of information contribution to machines—mastery, technicians, workers--, they cannot elaborate a value code that is capable of becoming universal, because they do not have the experience of technical reality as a whole. The technocratic attitude cannot be universalized because it consists of reinventing the world like a neutral field for the penetration of machines; constructing a metal tower or an immense bridge undoubtedly means making a pioneer work and showing how industrial power can leave the factory in order to gain in na-

ture, but there is something of the isolation of the inventor that subsists in this activity insofar as the tower or the bridge do not become part of a network covering the Earth in its mazes, in accordance with the geographical structures and living possibilities of this Earth. The Eiffel Tower and the Garabit viaduct must be considered as the arrival of the end of the industrial concentration around sources of energy or primary material sources, that is to say not as spectacularly isolated centers and successes, but as the first maze of a virtual network. The Eiffel Tower, which was entirely designed and fabricated in the factory, and only assembled on site, without a single correction, has now become the carrier of antennae; it interconnects with hundreds of pylons, masts, and stations by which Europe will be covered. It becomes part of this multifunctional network that marks the key points of the geographical and human world.[10]

It is the standardization of the subsets, the industrial possibility of the production of separate pieces that are all alike that allows for the creation of networks. When one puts railroad tracks over hundreds of kilometers, when one rolls off a cable from city to city and sometimes from continent to continent, it is the industrial modality that takes leave from the industrial center in order to extend itself through nature. It is not a question here of the rape of nature or of the victory of the Human Being over the elements, because in fact it is the natural structures themselves that serve as the attachment point for the network that is being developed: the relay points of the Hertzian "cables" for example rejoin with the high sites of ancient sacredness above the valleys and the seas.

Here, the technical mentality successfully completes itself and rejoins nature by turning itself into a thoughtnetwork, into the material and conceptual synthesis of particularity and concentration, indi-

viduality and collectivity--because the entire force of the network is available in each one of its points, and its mazes are woven together with those of the world, in the concrete and the particular.

The case of information networks is so to speak an ideal case where the success is virtually complete, because here energy and information are united again after having been separated in the industrial phase. At the same time, the assemblages and the substructures of the industrial gigantism return in a more manageable way, in a lighter form: electronics and telecommunications use reduced tonnages, moderate energies, dimensions that are not crushing. The factory rediscovers something of the workplace when it is transformed into a laboratory. It is no longer for the individual user, as in the artisanal modality, but for the simultaneously collective and individual user—nature itself[11]—that the laboratory anticipates a made-to-measure assemblage. Such lines of pylons, such a chain of relays constitutes the harness of nature. Only the fabrication of separate pieces remains industrial. At the same time, the distance between the inventor, the constructor, and the operator is reduced: the three types converge towards the image of the technician, this time both intellectual and handy, who knows at the same time how to calculate and how to install a cabling.

Very close to the case of information networks is that of networks of *energy distribution:* electric energy is at the same time information and energy: on the one hand, it can be indefinitely paired down without a loss of productivity. A vibrator, which is a motor, can be located in the point of a tool as light as a pencil and feed on the network. A human being can easily manipulate with one single hand a 1/3 horsepower engine. This energy can, at the very moment of usage, entirely be modulated by an information of which it becomes the faithful carrier. On the other hand, the very standardization of the conditions of

energy production, which allows for the interconnection and normalized distribution, turns this energy into the carrier of information: one can ask the alternative network to make function (as the source of energy) a watch whose workings it regulates as carrier of information. The simultaneous usage is concretized in the synchronic motor.

*Communication and transportation networks* are, by contrast, less pure. They do not succeed to reveal themselves in their true function, and the technical mentality does not succeed to make itself heard in any preponderant way, first of all because social or psychosocial inferences put a considerable burden [on these networks]; second, because unlike information or energy networks, they are not entirely new and without functional antecedents.

The railroad enjoyed a privileged situation because it was relatively clearly distinct from the road, which meant that it could develop in an almost autonomous way. In the case of these other networks, however, the social begins to manifest itself in the form of obsolescence, the kind of disuse that is linked to the aging of convention and the transformation of social habits rather than a wearing off or a loss of functionality of the technical object. A wagon with merchandise or a tender of a locomotive ages less quickly than a passenger car, with its ornaments and inscriptions: the one that is most overloaded with inessential ornaments is the one that goes out of fashion the most quickly.

But it is in the technical objects suited for the road network that the resistance opposed to the development of the technical mentality is the clearest: obsolescence hits the passenger car much faster than the utility vehicle or the agricultural tractor, which nevertheless are its close cousins—the car ages faster than the plane, whereas the plane has technically gone through more important transformations than the car. This is because the plane is made for the runway and for the air. It is necessarily a network reality before being a separate object.[12] The car is not only conceived as a *network reality*—like trucks—but as a social object, an item of clothing in which the user presents himself. It thus receives characteristics like the ones one used to wear on clothes and that overburdened them with lace and embroideries... these scurf-like ornaments of psychosocial life—here, they become paint, chrome, antennae. The social importance can also express itself through mass, volume, and the size of the vehicle.

To bring about the production of the technical mentality in the domain of voluntary choice, one could try to apply the categories of a common ethics of the relation between human beings, for example the category of sincerity: a car deteriorates quickly because it was made to be seen rather than to be used; the space taken up by the width of the doors is not protected against rust; the underside is not treated according to the principles of aerodynamics whereas the visible parts are abundantly profiled.

But the essential is not there, and the introduction of a dualist moral system of good and evil, of the hidden and the manifest, would not lead one very far. To find real norms in this domain, one must return towards the cognitive schemas that have already been drawn out, and ask oneself how they can respond to the exigency manifested by the pressing incoherence of the affective modalities.

The reason for the inessential character of technical objects, which is at the same time the cause of this inflation of obsolescence that has hit the population of produced objects, is the absence of an industrial deepening of production.

A car becomes obsolete very fast because it is not one and the same act of invention, construction, and production that simultaneously makes appear the road network and the cars. Between the net-

work--this functional harness of the geographical world—and the cars that traverse this network, the human being inserts himself as a virtual buyer: a car only comes to function if it is bought, if it is chosen, after it has been produced. There is a recurrence that comes into play on the basis of this mediation: the constructor, who has to produce serially, needs to calculate the possibilities of sales; he must not only simultaneously construct the network and the cars, but he also has to anticipate this sales option. In order to be valuable, a car must be bought after having been constructed, like the Roman child who was put into the world by the mother but was only admitted to life after *elevatio.* One could also compare this alienated condition of the produced object in the situation of venality to that of a slave on the market in Antiquity, or to that of a woman in a situation of social inferiority: the introduction to active existence happens through means that are inadequate to the real functions. It takes place against entelechy and thus creates a duality, a prevalence of the inessential, a distortion of true nature: choice is made under the dubious influence of charm, prestige, flattery, of all the social myths or of personal faiths. In the inessential situation of the buyer—who is neither a constructor nor a user in act—the human being who chooses, introduces into his choice a bundle of non-technical norms. It is the anticipation, in the project of production, of the play of these norms that creates the mixed character of the venality of the industrial product, and that is the main source of obsolescence. The distance between the act of production and the act of usage, this lack of real information allows for the introduction of the inessential, which creates obsolescence. Because it is judged once and for all, accepted or rejected in full in the decision or the refusal to buy, the object of industrial production is a closed object, a false organism that is seized by a holistic thought that was psychosocially produced: it allows for neither the exercise nor the development of the technical mentality at the level of voluntary decisions and norms of action.

But how is it possible to pass to a structure of the object that would allow one to draw out the technical mentality? First of all, and generally speaking, a position of ascetism allows one to get rid of the artificial and unhealthy character of social burdens, which expresses itself through hypertelic developments or developments that in reality don't function. A contemporary transatlantic liner--a fake floating city rather than an instrument of travel--slowly tends towards the recruitment of lonely, idle ones; the cargo ship is more pure. This proliferation of the inessential already takes hold of the commercial airplane: the companies flatter the traveler; the plane grows bigger and heavier. But the essential lies in this: in order for an object to allow for the development of the technical mentality and to be chosen by it, the object itself needs to be of a reticular structure. If one imagines an object that, instead of being closed, offers parts that are conceived as being as close to indestructible as possible, and others by contrast in which there would be concentrated a very high capacity to adjust to each usage, or wear, or possible breakage in case of shock, of malfunctioning, then one obtains an open object that can be completed, improved, maintained in the state of perpetual actuality. An electric machine that is not provided with an organ of protection, whether a fuse or a circuit breaker, is only in appearance more simple than a protected machine. When there is an overload, the system of protection kicks in, and the machine becomes absolutely comparable to what it was before the accident, once the system of protection has been returned to its initial state. This return to the initial state presupposes standardization, normalization; the more rigorous this normalization,

the more perfect the machine: this is the case of calibrated fuses, or also of electronic tubes that one replaces in a machine. This is the key point: the postindustrial technical object is the unity of two layers of reality: a layer that is as stable and permanent as possible, which adheres to the user and is made to last; and a layer that can be perpetually replaced, changed, renewed, because it is made up of elements that are all similar, impersonal, mass-produced by industry and distributed by all the networks of exchange. It is through participation to this network that the technical object always remains contemporary to its use, always new. However, this conservation in a state of full actuality is precisely made possible through the structures that the cognitive schemas provide: the object needs to heave thresholds of functioning that are known, measured, normalized in order for it to be able to be divided into permanent parts and parts that are voluntarily fragile, and subjected to replacement. The object is not only structure but also regime. And the normalization of *thresholds of functioning* expresses itself in the difference between relatively separate subsets [of the whole]: the degree of solidarity is precisely the measure (in the Greek sense of "metrion") of the relation between the permanent parts and the parts subject to replacement: this measure is what defines the optimum of the regime in the relation of thresholds of functioning.

In conclusion, one can say that the technical mentality is developing, but that this formation has a relation of causality that recurs with the very appearance of post-industrial technical realities: it makes explicit the nature of these realities and tends to furnish them with norms to ensure their development. Such a mentality can only develop if the affective antinomy of the opposition between the artisanal modality and the industrial one is replaced by the firm orientation of a voluntary push towards the development of technical networks, which are postindustrial and thus recover a continuous level [of operation].

If one seeks the sign of the perfection of the technical mentality, one can unite in a single criterion the manifestation of cognitive schemas, affective modalities, and norms of action: that of the *opening;* technical reality lends itself remarkably well to being continued, completed, perfected, extended. In this sense, an extension of the technical mentality is possible, and begins to manifest itself in the domain of the Fine Arts in particular. To construct a building according to the norms of the technical mentality means to conceive of it as being able to be enlarged, continued, amplified without disfiguration or erasure. The "Le Corbusier monastery" is a beautiful example of the contribution of the technical mentality in architecture: it includes within its plan its proper line of extension, for a further enlargement. And this is possible not only because of the architectural conception of the whole, but also because of the spirit of pairing down that manifests itself in the choice of forms and the use of materials: it will be possible, without any break between the old and the new, to still use concrete, shuttering, iron, cables, and the tubulature of long corridors. The non-dissimulation of means, this politeness of architecture towards its materials which translates itself by a constant technophany, amounts to a refusal of obsolescence and to the productive discovery amongst sensible species of the permanent availability of the industrial material as the foundation for the continuity of the work.

## Notes

1. [This unpublished text by Simondon was given to us by his son Michel, to whose memory this publication is dedicated.—J.-H. Barthélémy and Vincent Bontems. *Parrhesia* trans. Arne de Bouver also gratefully thanks Nathalie Simondon for her permission to publish this text.]

2. [W]hich has been rich in schemes of plasticity and of phase changes, reversible or irreversible. These come without a doubt from the artisanal techniques of preparation, the shaping and baking of the clay. These schemes of ontogenesis, coming from an operation entirely possessed by the human being, an operation that is continuous, progressive, and conform with the human being's scale, have encountered other schemes, themselves also ontogenetic, but including the encounter of opposed and qualitatively antagonist principles that are spatially and geographically distinct, and of a dimension that renders them *transcendent* in relation to the human being: the earth and the heavens, the hot and the cold, the dry and the humid. In order for these two realities to encounter each other, they have to be at the same scale. The nature philosophy of Antiquity comes from the encounter of the artisanal and the magical schemes of genesis, of the schemes of continuity and the schemes of discontinuity. Agriculture and nursery are indeed industries and craftsmanships, when the human being does not hold the possession of their means in hand.

3. [The French text is presented in the same way, with the sentence consisting of a relative proposition that adds an example to the previous sentence.—J.-H. Barthélémy.]

4. [This contradictory expression is used by Simondon to refer to the *overcoming of the classical oppositions* (which is what his entire thought aspired to). The "theory of knowledge" that Simondon invokes here is a theory whose task is to extend-overcome the "Copernican revolution" of Kant—who was already oriented towards the overcoming of the classical oppositions—by that which I have called, in my own work, an "Einsteinian revolution" or philosophical relativity. This entire paragraph by Simondon is of fundamental importance here, and its relation to the previous paragraph, which discussed cybernetics, extends the argument of his text "Allagmatics." In this text, Simondon presents cybernetics as a "theory of operations" that aims to "be a universal Cybernetics" *(L'individuation à la lumière des notions de forme et d'information [Individuation in light of the notions of form and information].* Paris: J. Millon, 2005, 561). One should therefore be careful not to reduce Simondon's thought to cybernetics, because the universality that is targeted in "Allagmatics" imposes a double critique of the cybernetic schema of feedback and the classical conception of information. Finally, it should be noted that the text "Allagmatics" also insists on what the end of the paragraph under discussion here will say more precisely: the theory of operations is relatively independent from the ontological domains of being.—J.-H. Barthélémy.]

5. When the Boeings started exploding in flight, it was a gross mistake to judge them as "bad planes"; a more precise approach has consisted in studying the behavior of cells subject to vibrations and constraints of internal suppression, so as to determine the zones of "fatigue" of metal. A jurist, De Greef, says in *Notre destinée et nos instincts* [Our Destiny and Our Instincts] that a criminal would never be condemned if he were judged in his "nursery" [in English in the original]; this is undoubtedly because, starting from this initial phase of his life, one would consider him as *constructed*, as composed of different layers in relative solidarity to one another.The condemnation generally sacrifices something by considering the individual as a homogenous whole. This is how racism and xenophobia are produced.

6. [On this famous "process of concretization," see the first chapter of Simondon's classic work: *Du mode d'existence des objets techniques.* [On the Mode of Existence of Technical Objects.] Paris: Aubier, 1958 (with several new editions since). Simondon is going to come back in this text as well to the famous example of "Guimbal's turbine".—J.-H. Barthélémy.]

7. In a certain sense, agriculture, nursing, navigation with sails are more industrial than artisanal, to the extent that they appeal to forces that d*o not depend on the human being,* and that come from a reality of which the scale surpasses the scale of that which can be manipulated. These operations introduce the *discontinuous* to the same extent; they are, eventually, alienating, and can give rise to a *magico-religious exercise of thought.* Indeed, they *commodulate the human operation of preparation and the cosmological action*. Human work remains without results, after the seeds have been sown or the ship has been constructed, if the cosmic act (rain, wind, overflowing of the river) does not come in to receive and amplify the human effort. The human effort must be in accordance with the cosmic act, and be "en kairo." In the nursing of cattle, the prosperity of the herd does not only depend on the growth of vegetables and of the regime of waters, but also on the epizooties.

8. [This is a citation of the title of a work by Georges Friedmann: *Le travail en miettes* [literally, "work in pieces"; translated into English by Wyatt Rawson as *Anatomy of Work: Labor, Leisure, and the Implications of Automation.* New York: Free Press of Glencoe, 1962—Trans.]. In *Du mode d'existence des objets techniques* [On the Mode of Existence of Technical Objects], in 1958, Simondon had extended and deepened Friedmann's reflection on the "physical and mental" alienation of the worker in a world of machines—capitalist as well as communist. The genius of Simondon was to show that the solution is not to condemn machines, but to recognize their status of a "technical individual" that must "carry the tools" and thus liberate the human being from its status as a simple assistant. Of course, the problem of unemployment that will be sparked by this simultaneous liberation of the human being and the machine means that such a progress would in fact only be possible within an *other* economic system, to which ecological risks, the current economic crisis, and also soon technical advances themselves—for example, the replacement of the human beings working as supermarket cashiers by machines—will *forcibly* lead us.—J-H. Barthélémy.]

9. Industry isolates the human being from nature because it takes charge of the relation human being-nature: it *is,* indeed, through the relation to the human being, which replaces the reality of the cosmic order (the wind, the rain, the overflowing of the river, the epizooty) while diminishing to a certain extent its independence in relation to the human being, but conserving the transcendence of the

dimension and the character of discontinuity, of irreversibility.

10. [The notion of "key points" had appeared in the Third and final Part of *Du mode d'existence des objets techniques* [On the Mode of Existence of Technical Objects], which dealt with a theory of the "phrases of culture". The "key points" characterized there the "primitive magical unity" as the human being's first mode of being—so before any "phase shift" of this primitive unity into the *technical* and the *religious* phase. If in this text, Simondon uses the notion of "key points" again, this time with respect to the technical world itself, it is because with the twentieth century, there emerges a *new unity* which will be that of the "multifunctional network" as a unity of the human being, nature, and technology. This is also what the rest of the text leads to suggest, and one must be attentive to the fact that Simondon's valuation of "networks of information" really dates from 1968, even from 1958: Simondon was in this respect a true visionary.—J.-H. Barthélémy.]

11. [It may seem strange that Simondon considers nature itself to be a user of techniques. The rest of the paragraph explains what he means by this: a "line of pylons" or a "relay chain" are "harnesses of nature". One could object that the *use* of techniques remains human here, and that nature is merely a constraint that imposes what Simondon calls the "madeto- measure assemblage". The latter would then be a false point of commonality with the workmen—for in the latter case, the "made-to-measure" refers to the *user.* This is why the real reason for Simondon's proposition lies elsewhere, namely in an extension—which is absent in this case but present in other texts—of what was said *at the same time* about the "thought-network" as unity of the human being and of nature and about the "laboratory". This extension consists of the following idea: in the *technical whole* that the *scientific and informationalized* laboratory represents, technical reality ultimately concretizes itself, a technical reality which effectively aims, through the instrument of knowledge *as technical relation of the human being to nature,* to enable *the nature that is in the human being* to transform itself into a "transindividuality" that is inseparably human and technogeographical. For the notion of "transindividual" and its link with technical "concretization", see *Du mode d'existence des objets techniques* [On the Mode of Existence of Technical Objects], 247-249, as well as the last chapter of *L'individuation psychique et collective* (forthcoming as Psychic and Collective Individuation with the U of Minnesota P).—J.-H. Barthélémy.]

12. [This status of the plane can be compared to what Heidegger says of the commercial plane in his famous seminar "The Question of Technology". I have myself discussed this comparison—which is also an internal critique of Heidegger's thought—in my article "La question de la non-anthropologie" ["The question of non-anthropology"] (in Vaysse, J.M. ed. Technique, monde, *individuation. Heidegger, Simondon, Deleuze.* [Technology, World, Individuation. Heidegger, Simondon, Deleuze.] Hildesheim: Olms, 2006. 117-132).—J.-H. Barthélémy.]

# A Thousand Ecologies:
# The Process of Cyberneticization and General Ecology

**Ecological Encyclopaedism**

"L'écologie, tâche de la pensée/ecology, the task of thinking"[1] says Michel Deguy. *Our* task of thinking, to be precise: our task of thinking *today* and *to come*, our *next* task of thinking. But the question then remains: what is this future task all about? What are its outlines? What are its stakes? From where has our *becomingecological* been written? And how is this emergence of a general ecology as opposed to a restricted ecology, which is taking place before our very eyes, to be characterized?

Deguy's exact phrase, "the task of thinking," employed to highlight the urgency and scope of the ecological question, had originally been used by Heidegger to sum up the end of philosophy and the reversal of thinking that had been caused by the technological ful-fillment of metaphysics as cybernetics. This choice of phrase is highly significant, as shining through it, atleast between the lines, Deguy allows us to perceive a reference to the process of cyberneticization as the technological condition of the general ecology of thought. This also to an extent goes against Heidegger's own use of the formula, and as such is an expression of mid-1960s observation may since have turned out to have been very accurate—in so far as it recognized early on the enormous scope of the cybernetic challenge to the dogmatic image of thought, and in so doing anticipated the replacement of traditional categories and leading differences (*Leitdifferenzen*) by concepts of command and control; nevertheless, his own account of what he called the "future task of thinking" remained ultimately strangely vague and sometimes even dominated by a counter-technological poetics.[2] This lack of clarity in relation to the wider noo-political horizon of the cybernetic age may in the first instance have been due to Heidegger's ultimately inadequate conceptualizations of the history and historicity of objects, which were excessively

dominated by an instrumental image of technology. Heidegger did not fully explore a real thinking of technological becoming, which would include the becoming of technology itself, arising from a fundamental transformation of the sense of technology as such, beyond its traditional tool-equipment/instrumental and mechanical derivations.[3] Furthermore, even as, for his own part, he continuously problematized and attacked the anthropological, that is, the humanistic, order, his own thinking was still too anthropocentric to be able to describe the future cybernetic and neocybernetic couplings of people, living beings, and technologies—in other words, of human and non-human forces—and to draw from them the necessary conceptual-political consequences. Neither was it able to describe the new fundamental experience and the new fundamental position under the technological condition, each of which is not only de-subjectivized and de-objectivized, but also, as we shall soon see in greater detail, presented as technically distributed, processualized, indeed environmentalized in a radically technological form, and which in their essential environmentality are hard to grasp using Heidegger's conceptual arsenal.[4]

The description that is now possible, half a century after Heidegger, of the task of thinking as ecological, has its strong diagnostic and conceptual-political bases precisely in the evolution of technological objectivity that has been observed since: the sense of the ecological as such—which determines both the task of thinking and the horizon of the cybernetic age—clarifies and unfolds itself, first and foremost, on an object-historical basis. Contrary to all of the ecological preconceptions that bind ecology and nature together, ecology is increasingly proving to epitomize the un- or non-natural configuration that has been established over more than half a century by the extensive cyberneticization and computerization of life.[5] The radical technological mediation that has been implemented since 1950 through the process of cyberneticization—and which today operates within the sensory and intelligent environments that exist in micro-temporal realms, in pervasive media and ubiquitous computing—causes the problem of mediation as such to come fully into focus, exposing it with a radicality never seen before. As such, it is both a problem and question of constitutive relationality; or, more precisely—to paraphrase Gilbert Simondon—the problem of an original relationship between the individual and its milieu, with which it has always already been coupled and which would not simply constitute a ready-made, prior "natural" environment to which it would have had to adapt, but which must rather be conceived as the site of its originary and inescapable artifacticity, with which it is conjoined, and with which it makes its appearance together; a co-evolution, or to use a term employed by Jean-Luc Nancy, a *comparution*.[6] One could initially suggest that ecology marks out both the present and future positions in the history of sense through which precisely this question of the primordiality of relation imposes itself. Relation must be understood as something that precedes the forming of the terms of the relation (subject, object, individual, groups, indeed all forms of collective human and non-human agents): predominantly, it must traverse all modes and levels of Being, from the micro to the macro, meaning that it is a "modality of being."[7] The phrase "Being is relation"[8]—which Didier Debaise rightly recognizes as a key phrase of contemporary thought as well as an expression of our current ontological state—encapsulates the fundamental principle of general ecology. In other words: in the insistence and virulence of the question of relationality, the core of our eco-technicity is revealed.

In line with Simondon's fundamental distinction between three forms or stages of the encyclopae-

dic spirit, the ecological task of thinking can, as a whole, be viewed as constituting what I propose to call the forthcoming fourth type of encyclopaedism. This is exactly what is at stake with the general ecology of technology and media. Simondon, who himself mapped out a complex ecology of participation based on the individual-milieu dyad and on the concept of the pre-individual, and who can thus without doubt be viewed as one of the pioneers of a general ecology,[9] differentiates between the ethical encyclopaedism of the Renaissance, the technical encyclopaedism of the Great Encyclopaedia and the Enlightenment, and finally, the technological encyclopaedism of his own cybernetic era. Each type of encyclopaedism is, principally, an expression of a society's fundamental desire "to attain an adult and free state, since the regime as well as the conventions of thought patronize the individuals and keep them in an artificial state of infancy."[10] Thus it is quite clear that for Simondon it is the force of the scientific, ultimately of technical thinking and of invention, that liberates and universalizes, enabling what he terms transindividuation by breaking up the closed social systems that control the processes of psychic-collective individuation—at least for a moment, before (re-)dogmatization takes place.[11] In particular, the evolution of technical objects proves to be the driving enlightening force. What matters is that all encyclopaedisms as such are always coupled with the history of technical objects. This coupling is crucial, even extending as far as the emergence of so-called open objects, open machines, and technical ensembles, which are to be regarded as operators of a new, cybernetic Enlightenment that, according to Simondon, eventually occurred in the mid-twentieth century: "Cybernetics is giving to man a new type of majority."[12] In this way, Simondon characterized, in 1958, the third, technological encyclopaedism. Due to the operationalization of finality as such, which

is probably its core undertaking, cybernetics ends the long-lasting regime of finality and the subordination to always already given ends. Simondon writes: "Man overcomes enslaving by consciously organising finality."[13] By putting an end to the regime of "means and ends," universal cybernetics (Simondon himself—who sharply criticized the first-order cybernetics of his day as well as its fascination with automatism and its fixation on adaptation—speaks of an "allagmatic," a transversal, unifying theory of operations) exposes mediation *as such* for the first time in history, forcing the question and the problem of mediation out into the open and making its organization the central issue of the era. This is, at least, cybernetics' enlightening aim: according to Simondon, it "enlightens the open processes of social and individual life. In this sense technology reduces alienation."[14] Mediation as such now becomes the core problem of encyclopaedism in our time.

Since these remarkable observations on alienation and on the enlightening spirit of cybernetics were made, not only have we advanced ever deeper into the organization and operationalization of mediation, not only have we given way to the promised openness of psychic-social processes and to the opening up of mediation; but at the same time, the all-encompassing cyberneticization and computerization of our form of life has brought with it a new form of closure, a new dogmatism, and a new form of bondage through mediation and processuality. The cathexis and exploitation of mediation and processuality by the big data industries that today—following Guattari—dominate our post-media era, form, at the very least, the scene of our contemporary alienation; and it is against this that we have to invoke a new, fourth, indeed ecological encyclopaedism, which is able to work out the new sense of mediation and processuality at the level of the evolution of technical objects and of the historicity

of object-hood or objecticity in general, advancing relational thinking.

The historical evolution of objects—which is the strictest precondition of ecological encyclopaedism—has long since begun to exceed all objectivity as such, so that the concept of the technical object has itself become, because of its fundamental environmentalization, problematic, if not obsolete. Mark B. N. Hansen describes the present and future condition thus: "We must reconceptualise the coupling of human and technics beyond the figure of the 'technical object.' In the wake of computational technologies that distribute sensibility beyond consciousness, the correlation between human-implicating individuation and technics has moved beyond what we might think of as its objective stage [...] and has entered a properly processual stage in which technics directly intensifies sub-perceptual dimensions of human experience. [...] The technical object had to make way for technical processes that operate through far more complex imbrications with human activity."[15] Instead of a technical mediation of perception, today's concern is "the more indirect technical mediation of an environmental sensibility."[16] In contrast to the ever-repeated refrain of a new immediacy, into which we (re)enter in the age of ubiquitous computing, ubiquitous media, intelligent environments, and so on, we are in fact now dealing with the absolute prioritization of mediation. The reconceptualization of processuality and relation, non-subjective subjectivity and experience, which correspond to this new object-historical position, and ultimately the redescription of *agency* and collectivity under the condition of a radical technical distribution, all this amounting to a working-through of the question of what (technical) mediation today actually means, as well as the corresponding amendment of the traditional ontological and epistemological frames that necessarily results from this: all this comprises the

task of thinking in the age of the fourth encyclopaedism, which will be ecological; and this is precisely what the title of a general ecology stands for.

**General Ecology of Media and Technics**

The great upending of the history of sense, in which we have found ourselves for more than half a century and which encompasses all possible universes of values and realms of being, has been characterized by a profound evolution of technical objects and a far-reaching set of consequences for the culture of sense (or senseculture / *Sinnkultur*). First—and this is the genesis of a new sense of technology—the work-tool, the instrument, the utensil, and finally even the machine become object-historically obsolete. Along with this, in particular, that which is associated with the corresponding objective formations, is devalued, including the principle of the model of the working subject, its concentrated action or active power and its peculiar meaningfocused sense-culture; object-relations and worldly relations as dominated by instrumental, use-oriented objects; and the corresponding ontological scheme which frames this use-oriented sense-culture, namely, hylomorphism. The transcendental subject—the epitome of this traditional sense-culture which, virtually from the moment of its recognition, has itself also been in a perpetual state of crisis—reveals itself to be an untenable illusion. Secondly—and this is the genesis of a new sense of sense—there is a parallel rise of technological ensembles and networks as new directives for the sense-culture. With these directives, the formation of fundamentally passive objects by active subjects, which had previously been the central activity of the sense-culture, is now moved a bit further into the background, as technical objects in general lose for the first time their minority position in the sense-culture and take on a

majority and autonomous status. The power of action is dispersed among and through them and is no longer focused on or assigned to the working-meaning subject. This dispersion concerns not only subjectivity and the subject, but incorporates, as we have already seen, objectivity and the constitution of the object itself, namely in the form of its dispersal into distributed technical processes. This entails the active and self-acting, not to say "intelligent" technological (in an eminent sense) object-cultures, or rather process-cultures, which are more and more migratory and submerged within our environments, informing our infrastructure, processing the backgrounds of our being and experience with the highest computational intensity, operating in new, micro-temporal regions, and which are shaping the face and the logic of contemporary cyberneticization. Contemporary technical ensembles and networks reveal a formerly concealed, yet in principle original participatory constitution, proving in fact to be agents of a primordial participatory condition, which they now make legible. They represent non-signifying, multi-agential assemblages and ultimately demand the elaboration of a radical relational ontology of participation able to give an account of this situation. It originates the new senseculture of technology—with multiple, transversal agencies beyond the centralization and monopolization of the working-meaning-perceiving human subject. Its decoding is the challenge faced by the new encyclopaedic effort.[17]

The more advanced contemporary theories of media focus on this environmental constitution, on which the general cyberneticization converges. The enormity and urgency of the need for ontological and epistemological reconceptualization—which reveals itself in the course of this working-through—conversely gives current media theory a key role to play in contemporary theoretical endeavors. Mark Hansen, whom one could refer to as one of the first main protagonists of this attempt, has analyzed the radicalized technical distribution of agency by twenty-first-century media as an explosion of "environmental agency" (rather than concentrating on the formerly privileged individual agents of human subjectivity); and in so doing, he has grasped the conceptual difficulties of a non-reductive understanding of non-trivial environmentality.[18] In view of the multiscalar medial surroundings, he stresses the necessity of a "radical environmental perspective" upon which "a radical generalization and reconceptualization of subjectivity" beyond the modern human subject could be based.[19] According to Hansen, media today, due largely to the colonization of everyday life by digital devices, smart chips, and sensors, have relocated from the site of the classical media functions such as recording, storage, and transmission "to a platform for immediate, action-facilitating interconnection with and feedback from the environment." Here, the meaning of technological media itself is transformed and an unprecedented media function emerges, which indeed ultimately brings to light the absolute inevitability of mediation and the primacy of technicity: the "recent developments in technical distribution, which is also to say, in the technical infrastructure of the environment" have for the first time "brought into the open and made accessible a human condition that is originary," establishing what Hansen calls *"our originary environmental condition."*[20] Hansen has begun to explore the very originarity of this condition, to carve out the ways in which "twenty-first-century media—the host of contemporary technologies that record and analyze data beyond the reach of our human sensory apparatus and that operate in Libet's missing half second"[21]—are media which *engineer* "the very sensible continuum" by which "experience occurs":[22] sensations, feelings, or rather micro-sensibilities

and microtemporalities, are edited, worked, or processed by environmental media cultures. As a result, potentiality as such, the process of individuation, indeed of becoming, mutates into a form of media-technological engineering. "Put bluntly, today's media no longer target human subjectivity as such (perceptual consciousness)," writes Hansen, "but rather aim directly to target the non-subjective subjectivity at issue in worldly microsensibility."[23] Luciana Parisi (to cite another important voice in media ecology) likewise very plausibly conceives of the corresponding techno-medial configurations that cyberneticize the modes of sensation by advancing the bioinformatic integration of sensors, mobile media, and digital atmospheres, as "technoecologies of sensation."[24] Drawing on Lynn Margulis' concept of the ecology of symbiogenesis (an autopoietic ecology of the "community of microorganisms of which we are made," in a broader sense an original ecology of the living, running from the micro- to the macro-scale, from prokaryotes to the autopoietic planet of Gaia, also encompassing media and technology), Parisi has referred to this new cybernetic affectivity that brings together the biological and the digital, as "symbiosensation: the felt experience of a nonsensuous relatedness between organic and inorganic matter adding on a new gradient of feeling in the thinking-flesh."[25] In her earlier work on "the new digital matrix" of our age of algorithms and of its new computational aesthetics, characterized by the processing of large quantities of data such that algorithms are exposed as new, nonhuman key actors, Parisi goes deeper into the analysis of so-called "algorithmic environments"— computational environments bursting with algorithmic objects. The cybernetization of media has turned them "from articulations of (human) expression, or from the aesthetic power […] to modulate affects" into "prehensive machines of the un-articu-

lable and un-representable."[26] Jussi Parikka's description of digital culture as universal viral machine, analyzes viral codes as non-human actors and as a constitutive part of the "general media ecology of network culture,"[27] as entities "internal to the media ecology of digital capitalism."[28] He developed a "conceptual perspective of media as an ecology"[29] in light of the contemporary media condition: his take on "unnatural ecologies" led him to elaborate what he calls "a milieu approach," mapping media "beyond the usual confines of technology and human intentions"[30] as "intensive capabilities that are constitutive of worlds," and as "brains that contract forces of the cosmos, cast a plane over the chaos."[31] "Media," he writes, "contract forces, but also act as a passage and a mode of intensification that affords sensations, percepts, and thoughts."[32] And if, up until now, Parikka has primarily employed media ecology as another media ethology of the living, he has more recently focused on the complementary aspect of a media geology of the nonliving, a kind of media history of the deep time of matter, of the minerals and of the underground of our media culture.[33] Finally, to name one last example, Bernard Stiegler's pharmacology of the current media-technological condition, and his critique of the associated hyperindustrial system of experience along with the symbolic, aesthetic, and spiritual misery it produces, focuses on the problem of an escalating destruction of the mind and of both psychic and collective disindividuation caused by the systematic exploitation, depletion, and destruction of desire. He works on reformulating political economy as a libidinal economy of sublimation and the production of spiritual values, which—and this is what is noteworthy— highlights the originary technicity of object relations and the primordial artifactuality of desire that lies at its core. Stiegler's analysis demonstrates that the

distributed technical milieu of the current processes of individuation and disindividuation is now increasingly being recognized as a libidinal ecology, or, as he puts it, as an "*ecology* of the spirit."[34] Stiegler's entire pharmacology of care revolves around this new ecology, which can be understood to be three-fold, as a "re-articulation of psychic, collective and technical individuation."[35]

One could cite many more neo-ecological studies, from Katherine Hayles' technological redescription of cognition;[36] via Dirk Baeker's next society of the computer ruled by the "ecological principle";[37] Brian Massumi's investigations of "environmentality" and the contemporary "ecology of powers"[38] as our coming form of governmentality; to Matthew Fuller's neo-materialistic media ecology.[39] These programmatic discoveries show how a new semantics describing the contemporary techno-medial condition is beginning to crystallize around the concept of ecology, whereby the concept of ecology itself is situated indisputably in processes of displacement, reformulation, and indeed revaluation. Notably, this is not about the mere metaphorization of a term that, in its original definition, would be bound to strictly biological, ethological, or life-scientific references. Quite the opposite, it is more likely the case that the traditional concept or discourse of ecology causes a breakthrough and imparts a principle form to the conceptual constellation, which as a consequence in the course of techno-medial development, ascends to the level of a critical intuition and model for the description of the new fundamental position. Canguilhem already anticipated precisely this when he wrote in 1947: "The notion of milieu is becoming a universal and obligatory mode of apprehending the experience and existence of living beings; one could almost say it is now being constituted as a category of contemporary thought."[40] In my view, this is exactly what we are now witnessing: the tech-

nological object-cultures with which we are coupled are currently driving the ecologization of sensation, with the additional consequence, however, of ecologizing cognition, thought, desire, and libido, as well as power and governmentality. In this respect, these new object-cultures form the pivotal moment in a correspondingly altered sense-cultural situation, whose technological unconscious from now on can generally be referred to as an ecological unconscious. In so doing, they unhinge the sovereignty and power of enactment accorded to the meaning-giving transcendental subject, which found its model in the working subject and had been long since subverted by technology. And it is these unnatural ecologies which have begun not only to bring about the far-reaching ecologization of sense-culture, but are also furthering the ecologization of the critical theory which accounts for them, and necessitating a general ecologization of thought.

There have already been many attempts to come to terms conceptually with precisely this new techno-ecological sense of sense, which can no longer be grasped through the key distinctions and premises of the era of meaning. These attempts have developed concepts including (but not limited to) assemblage, ensemble, montage, composition, hetero-genesis, symbiogenesis, being-with (*être-avec, Mit-Sein*), being-together *(être-ensemble)*, appearing-together/compearance *(comparution),* as *agency or as the entanglement* of human and non-human entities or actors. One of the true challenges and focal points of today's conceptual politics is to redefine completely the constitution of sense-culture across many areas, using the aforementioned concepts, which collectively have begun to constitute the new general ecology as well as the basis on which subsequent epistemological and ontological reforms can take place. I would argue that this is where the central conceptual- and the-

oretical-political battles and innovations of the past decade can be found, as well as their entire puissance. Jean-Luc Nancy, most recently, has made a far-reaching attempt at an appropriate redescription, working for more than a quarter-century on the upending of the constitution of sense through technology. Until recently there has without doubt been in Nancy's work a certain fixation on human actors and agency, which characterized his thought of the "being-with" and thus inevitably revealed the limits of his thinking on technology and of his reflections on the historicality of sense. In his work "De la struction" he abandons precisely this fixation in favor of a cosmo-political if not cosmo-technological condition. He has now begun, in a certain sense, by placing it on an equal footing with our technological condition, to conceive of the pure technicity of the being-with and the new sense-historical position as radically distributed: "What we are given consists only in the juxtaposition and simultaneity of a co-presence, whose 'co' has no specific meaning beyond the contiguity or juxtaposition within the limits of the universe itself."[41] It is precisely in this exposition of "struction," in the sense of *struo* as accumulation *(amasser)* or hoarding *(entasser)*, that the "lesson of technology" would be located, according to Nancy. In the technological age, and this is the key point, a "shift, a curving of the phenomenological dispositive" manifests itself, in the course of which the mere appearing-with/compearance is rendered as the "sense of the world."[42] It is no longer, as it was before, about an existential (and in turn, anthropocentric), but rather, a bare categorical "with." This revelation (in the sense of denudation) marks precisely, according to Nancy, the sense-historical situation of "struction," in which we are (re)located through technics and on account of which it is incumbent upon us "to discover everything anew; and above all sense."[43] Shortly thereafter he further

deepened this lesson and identified the "catastrophe of sense," to which we have been exposed, and thus explicated the "becoming-catastrophic" *(Katastrophisch-Werden)* of sense itself, the "itself-shifting" *(Sich-Wenden)*, the "being-comprehended-in-revolt" *(Im-Umsturz-begriffen-sein)*, the "collapsing-upon-one-another" *(Auf-einander-Einstürzen)* as the core of the great sensehistorical transformation.[44] On the basis of "interconnection" he eventually recognized the key characteristic of the present condition in a general ecology of sense: Nancy is explicit that this concerns "a kind of generalized environmentalism *(environnementalisme généralisé),* in the course of which everything is environed, enveloped, and developed according to the interconnectedness of what has been called the *technological unconscious*—'unconscious' meaning above all," here as elsewhere, the "interwoven fabric of all beings."[45] Whilst Nancy had previously brought the concept of "eco-technics" *(écotechnie)* into play in order to describe the general becoming-technical of the world, it is now, ultimately, a generalized ecology itself that figures as the pivotal moment in our highly technicized sense-culture. Put simply, the contemporary sense-historical position is, in a generalized sense, environmental.

If general ecologization thus represents a significant moment in the movement of our era and leads, under the new technological condition, into a new ecological paradigm—to echo Félix Guattari—then it also entails an extensive revaluation of the sense of ecology. Ecological discourse has repeatedly invoked figures of the undamaged and unscathed, the unspoiled, intact, and immune, the whole and holy. It participated in a "reaction to the machine," and to the uprooting, delocalization, and expropriation which resulted from what Derrida called the "tele-techno-scientific machine":[46] in this unswerving "drive to remain unscathed,"[47] figurations of the

self, of the being-with-oneself *(Bei-sichsein)* and of the being-at-home *(Zu-Hause-sein)* are always preferred, such that it pertains only to a restricted ecology—ecology as religion. The general ecology, on the other hand, which is emerging as the next ecological principle in the wake of the re-evaluation of the sense of ecology, obeys another, different, general economy. This is an unnatural, non-natural, and, one might say, subtractive ecology; an ecology that eliminates the immunopolitics of ecology.[48] It is an ecology of a natural-technical continuum, which the general environmentalization through technology and the techno-sciences and the concomitant explosion of agency, schematizes as the core of our current and, even more, of our future basic experience.[49]

**Wild Ecologies**

The French psychoanalyst and theoretician Félix Guattari tried from the late 1970s on to translate and convert this movement into a philosophical-political program. He not only drafted a heterogenetic image of being that is highly virulent today—teeming with creative processes and emergences—but also ended up evoking a new image of thought: one that is pre-personal and pre-objective, resembling the logic of primary processes—a polyvalent "eco-logic."[50] The elaborating of this "new ecosophical logic"[51] was assigned as the task of a "mental ecology," which has already cut through both the collective-social and the material-technological ecology, and has thereby been able to outline the general ecologization. However, the background of all these interests was also (and not least) for Guattari formed to a large extent by media-technological issues: on the basis of the potential of post-media practices—from video, Super8, pirate radio to video text/minitel, interactive databanks, and finally, the computer—

Guattari became predominantly interested in the emerging forms of a subjectivity that is detached, not just from the person or subject, but also from the human, and which undermines in particular the subjectivity that has been serialized, standardized, and normalized by the mass media. Finally, according to Guattari—and this is the crux—"animist cartographies of subjectivity"[52] should take account of a non-subjective subjectivity that is distributed in a multiplicity of relations. Guattari held that which is being implemented upon us through media technology to be a "machinic animism,"[53] a techno- and media-animism, as I would call it, precisely because this coming order might display a certain similarity and resonance with the non-modern, radically participatory assemblages of wild animisms, i.e. assemblages or collectives that prioritize participation as the primary and constitutive relation. The crucial intuition that the ecological encyclopaedism of the present must incorporate, with which it must connect and which it must work out in all its breadth, is the intuition of the virulence and valence of the concept of participation for the conceptualization of a strict relational thinking: only the latter is able to cope with the modes of subjectivity and objectivity that are distributed through environmental media technologies, and the irrefutably multi-agential, distributed nature of the agency that this entails.
The great theoretician of primitive mentality and mentor of a radical participatory thinking, Lucien Lévy-Bruhl, already wrote in his *Cahiers* in 1938: "For the primitive mentality, *to be is to participate.*"[54] With this phrase, he established the motto for describing wild Being and its non-alphabetical sense, which today, on the basis of media-technologies, is acquiring a surprising topicality and coming close to being re-invoked.[55] All of the growing number of neo-animists of the present, who study alternative conceptualizations of collectives, belongings, kin-

ships, and cosmologies—from Bruno Latour, Isabelle Stengers, and Donna Haraway through to the whole spectrum of post-humanistic approaches—bear witness to this. There is also, in particular, a strong new interest in animism within ethnology and social anthropology—I need mention only the work of Nurit Bird-David, Philippe Descola, Eduardo Viveiros de Castro, Alf Hornbog, and Tim Ingold; although all of these approaches are very different from one other, what they have in common is the presentation of animist systems as radical, relational ontologies and epistemologies. These purely relational systems appear to act as alternative cartographies for a non-modern reframing of our present and future technological world. The wild cosmologies may serve as metamodels for the urgent cosmo-technological reconceptualization of participation as constitutive relationality and therefore too of agency, relationship and relatedness, experience and subjectivity, all of which we need if we are to understand our no-longer-rejected originary environmental condition in a non-reductionist way. As Viveiros de Castro puts it, we need "richer ontologies"[56] than the traditional ones, through which we can account for this condition.[57] But at the same time, it is of course always important to approach and intensify these questions counter-animistically, in order to stay on the lookout for forms of participation, which at least in (neo)animistic contexts, go beyond the prevailing focus on modes of belonging, to the interrupting of belongings, to participations *without* participation, for example, imitation.[58]

In a certain sense, Simondon (to return to him once more in closing) is also a pioneer of this non-modern mapping of environmentality. By making the question of participation central to the general-ecological constitution, which led him to formulate an entire metaphysic of participation, he also recognized, at least in its rudi mentary form, an upcoming neo-animistic disposition. His evolutionary theory of technical objects did not just begin with an originary "magical unity": the latter is characterized as "the relation of a vital link between man and the world, defining a universe that is simultaneously anterior to every distinction between object and subject, and consequently also to every appearance of a separated object";[59] whereby here, absolutely nothing occurs unmediated: he emphasizes that "the mediation is still neither subjectivized nor objectivized," consisting of nothing more than "the simplest and most fundamental of all structurations of the milieu of a living entity."[60] In this sense, animistic systems are ways of representing an originary and unavoidable mediation. But Simondon also contemplated beyond this a kind of displaced recurrence of this condition within our radical techno-ecological formation, which brought in pre-subjective and pre-objective dynamic network milieus that are always developing, becoming (rather than retaining a fixed structure)—and which, indeed, are themselves the structuring agencies most responsible for shaping our contemporary existence and experience. Of course, Simondon at the time could not yet have divined the full extent, indeed the ubiquity of these milieus, as that which was to bring about the total cyberneticization. "In taking the size of the networks, technical reality turns back at the end of its evolution towards the milieu which it modifies and structures (or rather, *textures*) by taking account of its general lines; technical reality adheres to the world once again as at the point of departure, before the tool and the instrument."[61]

This is not to claim that we would ever have been animistic, or ever will be. It is rather a question of the many minor ecologies whose description began under this heading and which we can only today begin to grasp, in light of the general-ecological effort with its full capacity for modeling the non-modern work

of mapping the present and coming techno-medial world. It is a matter of that which almost certainly lies at the heart of the ecological encyclopaedism—a thousand ecologies.

*Translated from the German by James Burton, Jeffrey Kirkwood, and Maria Vlotides*

## Notes

1. Michel Deguy, *Écologiques* (Paris: Hermann, 2012), 31.

2. Martin Heidegger, "The End of Philosophy and the Task of Thinking," (1964) in Martin Heidegger, *Basic Writings*, ed. David F. Krell (San Francisco: Harper, 1977), 373–92. See also Erich Hörl, "Das kybernetische Bild des Denkens," in *Die Transformation des Humanen. Beiträge zur Kulturgeschichte der Kybernetik,* eds. Michael Hagner and Erich Hörl (Frankfurt am Main: Suhrkamp, 2008), 163–95; for an account of the fundamental ambivalence in Heidegger's reading of cybernetics, in which cybernetics are seen not only to represent and implement the end of the age of "Enframing" *(Gestell)* but also the entry into a new epoch in the history of being, see Erich Hörl, "Die offene Maschine. Heidegger, Günther und Simondon über die technologische Bedingung," *Modern Language Notes,* vol. 123 (2008): 194–217.

3. Heidegger does have incredible diagnostic intuition for the coming cybernetic age, which is what makes his thinking on this subject so valuable. He did not, however, produce a systematic study of the "historicality" of equipment *(Zeug),* although he frequently alluded to its having as many eras or epochs as the "historicality" of Being. See also Hubert Dreyfus "Heidegger's History of the Being of Equipment," in *Heidegger: A Critical Reader,* eds. Hubert Dreyfus and Harrison Hall (Oxford: Blackwell, 1992), 173–85.

4. For Heidegger's anthropocentrism, as well as for the inherent limitations of his anthropocentric conceptualization of environmentality *(Umweltlichkeit),* see Jean-Hugues Barthélémy, "La question de la non-anthropologie," in *Technique, monde, individuation. Heidegger, Simondon, Deleuze,* ed. Jean-Marie Vaysse (Hildesheim: Olms, 2006), 117–32; Jacques Derrida, *The Animal That Therefore I Am,* ed. Marie-Louise Mallet, trans. David Wills (New York: Fordham University Press, 2008), 141–60; Giorgio Agamben, *The Open: Man and Animal*, trans. Kevin Attell (Stanford, CA.: Stanford University Press, 2004); for the concept of neocybernetics see also Bruce Clarke and Mark B. N. Hansen (eds.), "Neocybernetic Emergence," in *Emergence and Embodiment: New Essays on Second-Order Systems Theory* (Durham, NC.: Duke University Press, 2009), 1–25.

5. Timothy Morton, with his well-known phrase "Ecology without nature," opposes the fundamental "ecologo-centric" belief that amalgamates ecology and nature (the latter understood in its modern sense, as an antonym of technology and culture, as an equilibrium, and as a state to which it is worth returning). Morton ignores or misses the object-historical basis of his own critique of ecologo-centrism, i.e. the question of the historicity of the concept of nature itself and that of its potential— and necessary—reconceptualization. See Timothy Morton, "Ecologo-centrism: Unworking Animals," *SubStance,* issue 117, vol. 37.3 (2008): 73–96.

6. Tracy B. Strong translates *comparution* using the Scottish common law term "compearance," referring to the act of appearing in court. See Jean-Luc Nancy and Tracy B. Strong, "La Comparution/ The Compearance: From the Existence of 'Communism' to the Community of 'Existence,'" *Political Theory*, vol. 20, no. 3 (August 1992): 371–98.

7. Gilbert Simondon, "The Genesis of the Individual," in *Incorporations*, eds. Jona-

than Crary and Sanford Kwinter (New York: Zone Books, 1992): 312.

8. Didier Debaise, "What is relational thinking?" in *Inflexions,* no. 5 (2012): 1–11.

9. Mark B. N. Hansen offers an initial elucidation of this field in "Engineering Preindividual Potentiality: Technics, Transindividuation, and 21st-Century Media," *SubStance*, issue 129, vol. 41.3 (November 2012): 32–59; see also my article, "Simondon's General Ecology" (forthcoming).

10. Gilbert Simondon, *Du Mode d'Existence des Objets Techniques* (Paris: Éditions Aubier, 2005 [1958] ), 95–6.

11. Transindividuality is "a relation, which connects individuals not by means of the constitutive individuality that originally separates them from one another, nor by means of that which is identical in every human subject, such as the *a priori* forms of sensory perception, but via this charge of pre-individual reality, this natural charge which is preserved alongside the individual being and contains potentials and virtuality." (Ibid., 248) The invented technical object is both symbol and vehicle of the transindividual relation. (See also ibid., 247).

12. Ibid., 104. For the concept of the open object, see Gilbert Simondon, "Technical Mentality," *in Gilbert Simondon: Being and Technology,* ed. Arne de Boever et al. (Edinburgh: Edinburgh University Press, 2012), 1-119.

13. Simondon, *Du Mode d'Existence des Objets Techniques*, op. Cit., 103.

14. Ibid., 106.

15. Hansen, "Engineering Pre-Individual Potentiality," op. cit., 51 and 55.

16. Ibid., 48.

17. For a more precise description of the technological shift in meaning, see Erich Hörl (ed.), *Die technologische Bedingung. Beiträge zur Beschreibung der technischen Welt* (Berlin: Suhrkamp, 2011), 7–53, especially 7–23.

18. Mark B. N. Hansen, "System-Environment-Hybrids," in Bruce Clarke and Mark B. N. Hansen (eds.), op. cit., 113–42.

19. Mark B. N. Hansen, "Medien des 21. Jahrhunderts, technisches Empfinden und unsere originäre Umweltbedingung," in *Die technologische Bedingung*, ed. Erich Hörl, op. cit., 367.

20. Hansen, "Engineering Pre-individual Potentiality," op. cit., 33.

21. Ibid., 57.

22. Ibid., 56.

23. Ibid., 57. See also Mark Hansen, "Ubiquitous Sensation: Toward an Atmospheric, Collective, and Microtemporal Model of Media," in *Throughout: Art and Culture Emerging with Ubiquitous Computing,* ed. Ulrik Eman (Cambridge, MA.: MIT Press, 2013), 63–88.

24. Luciana Parisi, "Technoecologies of Sensation," in *Deleuze |Guattari & Ecologies,* ed. Bernd Herzogenrath (New York: Palgrave, 2009), 182–99.

25. Ibid., 192.

26. Luciana Parisi/Erich Hörl, "Was heißt Medienästhetik? Ein Gespräch über algorithmische Ästhetik, automatisches Denken und die postkybernetische Logik der Computation," *Zeitschrift für Medienwissenschaft (ZfM),* no. 1 (April 2013): 35–51.

27. Jussi Parikka, *Digital Contagion* (New York: Peter Lang, 2007), 10.

28. Ibid., 5.

29 Ibid.

30. Jussi Parikka, *Insect Media: An Archaeology of Animals and Technology* (Minneapolis: Minnesota University Press, 2010), xviii.

31. Ibid., xxvii.

32 Ibid., xxvi.

33. Parikka developed this perspective in a lecture he delivered at the Bochum Colloquium for Media Studies (bkm) on January 16, 2013, titled: "An Alternative Deep Time of The Media: A Geologically Tuned Media Ecology."

34. Bernard Stiegler/Frédéric Neyrat, "Interview: From Libidinal Economy to the Ecology of the Spirit," *Parrhesia,* no. 14 (2012): 9–15. See also Erich Hörl, "Wunschhund Technik. Stieglers Genealogie des Begehrens," in Bernard Stiegler, *Hypermaterialität und Psychomacht,* ed. Erich Hörl (Zurich: diaphanes, 2010), 7–33.

35. Ibid. Dominic Pettman, in *Human Error: Species-Being and Media Machines* (Minneapolis: University of Minnesota Press, 2011), 171–77 emphasizes the anthropocentric tenor of Stiegler's key distinction between *désir* (desire) and *pulsion* (drive). According to Stiegler, humans are libidinal animals: only humans have desire and are capable of sublimating drives into desire, whereas animals are driven only by instinctsand drives. More is needed on the relationship between drive and instinct. But this anthropocentric bias, which is a fact, is already inscribed in Stiegler's thinking of the originary technicity of man as the fundamental primordiality of (de)fault and lack. This key figure within his theory of technics and desire must be read simultaneously as both a de-anthropologizing as well as a re-anthropologizing operation. This anthropocentric inscription in Stiegler's libidinal ecology is the inherent limit of his ecology, always already constraining it, bending it back from being a general ecology into a restricted one. Stiegler's adherence to the concept of the (technical) object at the point of entering into a distributed process-culture repeats this same political-theoretical operation. It is therefore unsurprising that his theory leads further and further towards a neo-humanistic position whose remaining a thropocentric content is yet to be discussed and clarified.

36. Katherine Hayles, *How We Think: Digital Media And Contemporary Technogenesis* (Chicago: University of Chicago Press, 2012).

37. Dirk Baecker, *Studien zur nächsten Gesellschaft* (Frankfurt am Main: Suhrkamp, 2007), 225.

38. Brian Massumi, "National Enterprise Emergency: Steps Towards an Ecology of Powers," *Theory, Culture & Society,* vol. 26, issue 6 (2009): 153–85.

39. Matthew Fuller, *Media Ecologies: Materialist Energies in Art and Technoculture* (Cambridge, MA.: MIT Press,, 2005).

40. Georges Canguilhem, "The Living and Its Milieu," in *The Knowledge of Life,* eds.Paola Marrati and Todd Meyers (New York: Fordham University Press, 2008), 98.

41. Jean-Luc Nancy, "Von der Struktion," in *Die technologische Bedingung,* ed. Erich Hörl, op. Cit., 54–72, 63.

42. Ibid., 66f.

43. Ibid., 72.

44. Cf. Jean-Luc Nancy, *L'Équivalence des catastrophes (Après Fukushima)* (Paris: Galilée, 2012), 20.

45. Ibid., 59.

46. Jacques Derrida "Faith and Knowledge: The Two Sources of 'Religion' at the Limits of Reason Alone," trans. Samuel Weber, in *Religion*, ed. Jacques Derrida and Gianni Vattimo (Stanford, CA.: Stanford University Press, 1998). For an essential text on the immunopolitics of the unscathed see Frédéric Neyrat, *Biopolitique des Catastrophes* (Paris: Éditions MF, 2008); and likewise, his book *L'Indemne. Heidegger et la destruction du monde* (Paris: sens et tonka éditeurs, 2008).

47. Derrida "Faith and Knowledge," op. cit., 45.

48. I hesitate to call it, as Timothy Morton has, "ecology without nature." It is not essentially a matter of rejecting nature as such, but rather, of a new thinking and reconceptualization of nature; namely, as the nature-technics with which we are confronted by the necessity of general ecology. Those celebrating the end of nature misjudge nature's historicality. With regard to the possibility of a speculative view of nature at the level of the technological condition, such as Simondon's pre-individual nature, see for instance Debaise's "What is relational thinking?" op. cit.

49. Although the difference between a general and a restricted ecology is a systematic difference—formulated in line with Bataille's distinction between a general and a restricted economy which Derrida referred to so concisely as an economy of sense—there is also a certain historical bias within this distinction. I think we have a tendency to move from a restricted to a general ecology, at least in terms of conceptual and political theory. A re-reading of Bataille would demonstrate that his own general economy is already a general ecology. I need only mention the text "L'économie à la mesure de l'univers" (1946) where he speaks of the "principle of life itself" being an economy of the sun, and even of "le sens du soleil," the sense of the sun. Many thanks to David Wills for insisting that the relation of general economy and general ecology needs more development.

50. Félix Guattari, *The Three Ecologies*, trans. Ian Pindar and Paul Sutton (London: Continuum, 2005 [1989] ), 30. For a heterogenetic image of being, see his "The new aesthetic paradigm," in Félix Guattari, *Chaosmosis*, trans. Paul Bains and Julian Pefanis (Bloomington: Indiana University Press, 1995 [1992] ), 98–118.

51. Guattari, *The Three Ecologies,* op. cit., 34.

52. Félix Guattari, "Entering the Post-Media Era," in Félix Guattari, *Soft Subversions. Texts and Interviews 1977–1985,* ed. Sylvère Lotringer (Los Angeles: Semiotext(e), 2009), 301–6: 302.

53. See also Angela Melitopoulos and Maurizio Lazzarato, "Machinic Animism," in *Animism (Volume I),* ed. Anselm Franke (Berlin: Sternberg Press, 2010), 97–108.

54. Lucien Lévy-Bruhl, Carnets (Paris: Presses universitaires de France, 1949),22.

55. In my book Die heiligen Kanäle. *Über die archaische Illusion der Kommunikation* (Berlin: diaphanes, 2005), I have extensively detailed the extent to which the elaboration of the concept of animism at the end of the nineteenth century and beginning of the twentieth, and particularly in the work of Lévy-Bruhl, already represented a reaction to the rise of an essentially nonalphabetic, electromagnetic transmission culture, and was thus already essentially a first, historically marginalized indication of the post-alphabetic situation.

56. Eduardo Viveiros de Castro, "Exchanging Perspectives: The Transformation of Objects into Subjects in Amerindian Ontologies," in Franke (ed.), *Animism,* op. cit., 227–43.

57. Already in 1988, Paul Bouissac noticed "the tendency toward a scientifically based neo-animism which could radically transform not only the attitudes of contemporary humans towards animals, but the whole gamut of cultural definitions and philosophical assumptions upon which the twentieth century's global civilization has been constructed." He also spoke of a necessary "shift in cosmology which seems to be a prerequisite for steering human industriousness in a more adaptive direction." (Paul Bouissac, "What is a human? Ecological semiotics and the new animism," in *Semiotica,* vol. 77, no. 4 (1989): 497–516, here 514.)

58. Thanks to Mark B. N. Hansen for raising this issue in a discussion we had.

59. Simondon, *Du Mode d'Existence des Objets Techniques*, op. Cit., 163.

60. Ibid.

61. Gilbert Simondon, *L'Invention dans les techniques. Cours et conférences,* ed. Jean- Yves Chateau (Paris: Seuil, 2005), 101.

# What You Resist Persists:

# Automation, Automatism and Autonomisation

The following essay forms an attempt to sketch three terms. Effectively in this context   I will focus specifically upon 'autonomisation'. Autonomisation or 'autonomization' (US) is a term I first encountered in Frederic Jameson's work, specifically his article 'Culture and Finance Capital'. However the term also appears in the late writings of Félix Guattari as well as the writings of left-communists Jacques Camatte, Cornelius Castoriadis and the French collective, theorists of communisation, Théorie Communiste.[1]

In Frederic Jameson's work, Autonomisation has at least two significant insights, the first is related to the continuity of capitalist form from Fordism to financialisation (via Taylorism). The second pertains to what Harry Braverman calls 'habituation' and that which breaks with it. Both of these points of interest will be related to debates in aesthetics and the reason for this is: that contrary to discourses around political autonomy, these aesthetic debates em-phasise and work through labour and humankind's determination under capitalism (its unfreedom and alienation) finding their exit through it, not outside of it. In Jameson's writings the term appears in similar sections in *Brecht and Method (*1998) and *The Prison-House of Language* (1972), (on Structuralism and Russian Formalism). Drawing upon Harry Braverman's study, *Labor and Monopoly Capital,* Jameson, attempting to develop a theory of 'modernist formal processes', poses Modernism as a cultural response to an intensification of 'reification' (as was realism before it).[2]

I found it interesting and productive to see this particular process in terms of autonomization: what were formerly parts of a whole become independent and self-sufficient. It is something that can be observed in the chapters and their subepisodes in *Ulysses*, and also in the Proustian sentence. I wanted to establish a kinship here, not so much with the sciences […], but with the labor process itself.

And here the great phenomenon of Taylorization (contemporaneous with modernism) slowly imposes itself: a division of labor (theorized as long ago as Adam Smith) now becoming a method of mass production in its own right by way of the separation of different stages and their reorganization around principles of efficiency.[3]

Perhaps instead of literature, an arguably more straightforward aesthetic work through which to imagine the correspondence between Talorisation and modernism, is the line-dancing show dancers, The Tiller Girls, as described by Seigfried Kracauer. These mass spectacles of drilling 'girl-units' are:

[...] conceived according to rational principles which the Taylor system merely pushes to their ultimate conclusion. The hands in the factory correspond to the legs of the Tiller Girls [...] The mass ornament is the aesthetic reflex of the rationality to which the prevailing economic system aspires.[4]

## Promiscuous Productivism

Taylorism is central to Braverman's study of the development of the labor process through the 20th century. This is because he believes: 'Taylorism [...] is nothing less than the explicit verbalization of the capitalist mode of production.'[5] Taylorism does not describe a period or phase of capitalist organisation of production, but rather it is its very continuity, 'if Taylorism does not exist as a separate school today, that is because, apart from the bad odor of the name, it is no longer the property of a faction, since its fundamental teachings have become the bedrock of all work design.'[6] For Braverman, at some point in the early 20th Century, Taylorism became generalised. The fact that Taylor's techniques became known in German simply as 'rationalisation' will give you some sense of the continuity with which it applied in our present moment – to the labour process and

organisation of work (and arguably even unwaged-work) from academic work, to service work in Pret A Manger tasks are measured, an economy of input and output is established, targets are created and extended, decision-making is centralised, costs are cut. Moreover, the paucity of an understanding and critique of Taylor's innovations are borne out when Braverman discusses Lenin's enthusiastic adoption of Taylor's techniques. Despite describing Taylorism in 1914 as 'Man's Enslavement by the Machine'[7], Vladimir Lenin, once the Bolsheviks were in power, expressed his admiration for Taylor's system and sought to adapt its techniques for the purposes of rapidly industrialising the Soviet Union.

The possibility of building socialism depends exactly upon our success in combining the Soviet power and the Soviet organization of administration with the up-to-date achievements of capitalism. We must organize in Russia the study and teaching of the Taylor system and systematically try it out and adapt it to our ends.[8]

The productivism embodied by Taylorist management was, in Rabinbach's words, 'politically promiscuous'. Its technocratic idealism found supporters across the political spectrum during a period which was characterised, despite the immense destruction of the First World War, by belief in an endless expansion of productivity and a 're-enchantment of technology'.

The vision of a society in which social conflict was eliminated in favour of technological and scientific imperatives could embrace 'liberal, socialist, authoritarian, and even communist and fascist solutions'.[9]

Historical commentators may dismiss Lenin and Bolshevism as inherently authoritarian, yet it is clear that though both Taylorism and Bolshevism shared authoritarian traits, even in anarchist Spain in the 1930s anti-authoritarian elements felt 'compelled' to adopt similar measures. We could discuss the adop-

tion or worse, distanced admiration, amongst the French left under the popular front, later pro-Vichy syndicalists and even in Anarchist Spain.[10]

**Devices of Alienation**

In his development of the analogy with the assembly line; the separation of processes, breaking ever further into discreet units of production, Jameson cites two key figures, Bertolt Brecht and Viktor Shklovsky. Each, in different ways, had explored developments of perception and apperception (that is the perception of perception e.g. Brecht's phrase 'showing has to be shown') in art by formulating what we could call homeopathic responses to alienated experience under capitalism. Brecht had famously formulated a set of techniques in the theatre he summed up as the *Verfremdungseffekt*.[11] Though most commonly known in English as the alienation effect, *Verfremdungseffekt* can be rendered as alienation, detachment (John Willett's preference), distanciation (French), or estrangement effect. Though *Entfremdung* – alienation (in the sense Hegel and Marx use it) is close enough for Brecht to have once or twice used the earlier term in the same sense as the latter. Brecht's derivation of the term is most likely an adoption of the concept of *ostranenie* used commonly by Russians Brecht met in Moscow and Berlin, (Sergei Tretiakov and Sergei Eisenstein).[12] The term was developed by Russian Formalist Viktor Shklovsky. *Priëm Ostranenniya or ostranenie or ostranit'* (verb) can be rendered as: defamiliarisation, estrangement, making strange, making it strange or simply making things strange.
Shklovsky speaks of *ostranenie* as a process or act that endows an object or image with 'strangeness' by 'removing' it from the network of conventional, formulaic, stereotypical perceptions and linguistic expressions (based on such perceptions).[13]

Shklovsky clearest formulation is given in the essay 'Art as a device':
[…] in order to return sensation to our limbs, in order to make us feel objects, to make the stone stony, man has been given the tool of art. The purpose of art, then, is to lead us to a knowledge of a thing through the organ of sight instead of recognition. By 'estranging' objects and complicating form, the device of art makes perception long and 'laborious'. The perceptual process in art has a purpose all of its own and ought to be extended to the fullest.[14]
*Ostranenie* is a neologism, and this is important for Shklovsky's thought in that, even for Russians, it would demand exactly the special effort of imagination that the device is intended to engender. The tradition of Russian Formalism in which Shklovsky worked, insisted that literature amounted to an hermetic system, containing its own formal logic and rigour which would be followed and remade by each writer in their work. '[…] these two languages, that is, the poetic and the practical, do not coincide.'[15] Rather than expressing the self, literature or art expresses itself, its rules, its freedoms and unfreedoms (which in turn pull into itself and transform the determinations of the external world – of life).[16] In Shklovsky's description, art is a device for making the familiar unfamiliar, for directing 'automatic' perception towards the particularity of objects and relations. Content, is under this system, simply a pretext for the uprooting of habitual perspectives through literary devices. Moreover, rather than a hylomorphic system by which a form is filled with a content, Shklovsky and the Russian Formalists developed the complex of multi-perspectival mediations in literature by which different devices can effect and transform each other. In this sense, the formalists discovered that in literature the constituting elements of a sentence – words – are not in turn constituted by syllables but also sounds. Sounds can carry meaning but also

*trans-sense language*. Artistic technique in literature can be composed of 'rhetorical figures, linguistic and lexical facts, phonetic or rhythmic elements, and methods of composition and plot construction […]' but also the *absence* of one or more of these.[17] Similar movements throughout the 20th century developed these formal concerns with reduction, separation and so on: OULIPO, Lettrism, L A N G U A G E poetry and sound and concrete poetry each explored the breaking down of prose and poetry into smaller independent units – clearly an important $w$-model for Shklovsky and those who followed after is filmic montage. Therefore, employing the logic of autonomisation, following through what Kracauer called the 'capitalist *ratio*', in art at least, becomes a means to 'make everything new'.

If we examine the general laws of perception, we see that as it becomes habitual, it also becomes automatic. So, eventually all of our skills and experiences function unconsciously – automatically. […] It is this process of automatization that explains the laws of our prose speech with its fragmentary phrases and half-articulated words.[18]

## Autonomisation and Financialisation

Following Braverman, Jameson extends his concept of autonomisation to describe and explain the process of financialisation and the exponential expansion of finance capital since the 1970s. Through finance, capital no longer passes through the classical equation M-C-M' but instead M passes directly to M Prime. Money makes money. Frederic Jameson:

In other words, riches transform into capital itself; this is the autonomization of the process of capital accumulation, which asserts its own logic over that of the production and consumption of goods as such, as well as over the individual entrepreneur and the individual worker.[19]

In finance, autonomisation describes eloquently the multi-polar way in which markets seek new vectors of profit, treating investments and debts as the material for many-sided bets and counter bets, spun off over and over as commodities to be traded, secured and re-secured. The steep autonomisation of these processes can be seen in the recent scare stories over high frequency and automatic trades. High volumes of trading are increasingly automated and take place at a speed beyond human perception – this circulating capital moves faster than human time – with all the threats that poses.[20] Here it is worth noting the feedback loop between computing and management, Charles Babbage was a big influence upon Taylor – the early foundations of computing informed the development of intensive management of the labour process – in turn IBM's punch card system which made abstract labour time into a 'physical reality' – a technical object – was developed after the second world war as the model for early computing systems.[21]

## Cybernetics and Grammatisation

In this context, of interest is Matteo Pasquinelli's recent research into Romano Alquati's work on cybernetics (published in *Quaderni Rossi* in two parts in 1962 and 1963). Alquati attempted one of the first Marxist analyses of cybernetics. Alquati saw cybernetics as an extension of the internal bureaucracy that monitors the production process of the factory via control information (*informazioni di controllo*).

Cybernetics recomposes globally and organically the functions of the general worker that are pulverised into individual micro-decisions: the bit links up the atomised worker to the figures of the Plan.[22] Moreover, to outline a second pole of further possible research: feedback, if we follow Benedict Seymour's recent argument, can be seen as deriving

from the value form itself as a kind of 'Ur-form of feedback' – self-valorising value.[23] The extension, through not only cybernetics but also pharmacology, of the technical training of workers and ongoing removal from them of their capacities and their transfer to machines is discussed by Bernard Stiegler as 'grammatization'.

The grammatization of gesture, which was the basis of what Marx described as prolerarianization, that is, a *loss of savoir-faire,* is then pursued with the development of electronic and digital devices to the point that all forms of knowledge become grammarized via cognitive and cultural mnemotechnologies. This will include the way in which linguistic knowledge becomes the technologies and industries of automated language processing, but it will also include *savoir-vivre,* that is. behavior in general, from user profiling to the grammatization of affects-all of which will lead toward the 'cognitive' and 'cultural' capitalism of the hyperindustrial *service* economies.[24]

Through these insights Stiegler advances a theoretical renewal of industrial society based on a departure from the 'complex of consumption', but this is guided by an essentially technical solution which springs not from the explosion of contradictions internal to capital, but rather a managed resolution of those contradictions.[25] His critique of proletarianisation relates to the gradated loss of knowledge by the worker, but the workers' alienation – 'absolute poverty' –  is not simply a problem of perception but one of actual material dispossession. This dispossession is integral to the relationship between capital and labour. At a higher level it is repeated in the highly abstract edifices of financialisation, this process of dispossession is reproduced at an even greater and global remove, it is a process carried out with machines, but it is also a machinic and self-reproducing relation. It is a question of knowledge at both the simplest level and the most complex, but for Marx, it is fundamentally a first a question of material dispossession (including the dispossession of sense-perception and knowledge) at both the simplest level and the most complex.

## Terminal Autonomisation

Some further insights from Jacques Camatte, who had discussed finance in terms of autonomisation as early as 1974, describing an: 'Autonomization of the different products of capital – profit, interest and land rent.'[26]

Autonomisation – which is also 'the runaway of capital', becomes a threat, a tendency which threatens to negate capital's very basis of accumulation – 'the question that poses itself is how to know how to link the different autonomized movements that are self-autonomizing so that it should not end up in the disaggregation of the totality.'[27] Camatte frames autonomisation as a historically consistent process for capital: '[...] for Marx each moment of capital becomes more or less autonomised capital [...]'.[28] In line with Camatte's view a recent text by two Brazilian academics, Tomas Nielsen Rotta and Rodrigo Alves Teixeira,   writing about the financial crisis in the US theorises autonomisation thus:

Autonomisation refers to the ontological tendency that capital has to separate from and to undermine its own material basis of expansion [...] The theory of autonomisation has at its core the understanding that the expansion of value constitutes a contradictory dynamic that has both self-enhancing and self-negating effects.[29]

Camatte understands the expansion of finance capital as a terminal form of autonomisation (money freed of production to self-augment) which challenges capital's ability to pass through surplus value extraction – an escape from the law of value – only made viable by 'anthropomorphosis' the absorption

of the totality of 'human substance' into capital: 'the total development of capital as a finished structure, and better still, material community, allows it to escape this fiction because this is accompanied by the phenomenon of anthropomorphosis'.[30] Capital becoming subject is discussed by Marx with regard to machinery and in the Grundrisse. '[...] the automaton itself is the subject and the workers are merely conscious organs, co-ordinated with the unconscious organs of the automaton.'[31] Yet to suggest this as a 'final solution', rather than a fatal contradiction, for capital is perhaps going too far. Capital and labour are bound in an integral relationship and in the current period we can identify each exhibiting tendencies to attempt to escape mediation by the other with many attendant problems and crises.[32]

**Autonomisation, Liberation and History**

Camatte connects liberation and autonomisation (proposing that at each phase of autonomisation, of 'imprisonment of the human being in piecemeal fashion' there is a correlative movement towards liberation – or autonomy 'an activity to break passivity and dependence').[33] Théorie Communiste (TC) extend this to social movements: 'As for activism, it is the autonomisation of this cycle, with all the necessary ideological reformulations that this implies.'[34] TC consider the present 'crisis of the wage relation' the writing on the wall for movements to affirm a worker identity within capitalism (the workers movement) and without as social movements ('another world is possible'). In the group's conception, each are forms of alter-autonomisation. In each the limit poses itself at the point of the mobilisation of (abstract man) 'individuals' and affirmation in State and in capital as 'an unsurpassable horizon', that is each derives its autonomy from capital – a positive opposition from its relation to a negative relation.

The disappearance of alternative-leaning activism, and of activism in general, is a result of the development of immediate struggles in which the production of class belonging as an external constraint is the very fact of the struggles of the proletariat in its reciprocal implication with capital, rather than as autonomisation in opposition to capital.[35]

This poses then the question of the correlation between the movement of capital or phases of autonomisation and social movements proposing forms of 'liberation'. For example, the late 1960s and 1970s can be seen both as the release of workers from the factory, refusal of work, forms of autonomy, creation of new subjectivities, and a tremendous defeat through the imposition of neoliberalisation and shift to forms of finance and service related 'industries'. An alternative, without the destruction of capitalism and capitalist technology tout court means an alternative development of capitalism.

Here then, there are some contradictions – as opposed to these 'alter-autonomisations', *forms* of class struggle and social organisation which pass through the logic of autonomisation (recognising that which they autonomise from, or fail to) may appear to be the way to confront and move beyond capital's rationalising self-extension. This suggests that instead of TC's 'positive against positive' what could be developed are forms of 'double negative' (to use the of an issue of *Mute)*. The positing of the 'bad old things' – of humankind neither as abstract man (the individual) nor as organic unity. For Adorno, 'Only separation can countermand separation'.[36] Therefore the focus of a movement which would address capital's autonomisation would not involve developing correctives to alienation but developing alienation further in such a way as to bare the present state of things and force self-consciousness into conflict with anthropomorphism. The aesthetic critique is a critique which pursues and makes oper-

able separations, as a forms of 'mimesis of the hardened and alienated' it confronts capital on its very principles of rationality by carrying them through, yet displaces this out of the exigencies of a *productive* circuit.[37]

Viktor Shklovsky's theory of estrangement and his trajectory of 'ostensible surrender' can be situated within the subsumption of aesthetics and human capacities under a generalising Taylorist logic – both cultural and production-oriented – in post-revolutionary NEP-era Russia. Shklovsky is criticised by Jameson for lack of 'historical' insight. Yet here we might add, that as a Lukácsian, Jameson remains exposed to Moishe Postone's critique of Lukács celebration of historical process. In a note, i*n Time, Labour*, *Social Domination,* Postone points out that one cannot separate out 'historical process' as non-capitalist. Rather, life under capital is characterised by 'a historical dynamic beyond human control', siding with this process rescues nothing. 'Historical process as such cannot be opposed to capitalism.'[38] Whilst capital seeks to impose unity, empty homogenous time, attention to artworks instead sharpens our sense of the particular, the fragmentary and its undigestible heterogeneity: 'social reality is stepped – it is multi-temporal. The epochs existing in it either clash or peacefully coexist.'[39]

**Formalism and Cognition**

However, whatever Formalism's claims to historicity, we discover recently, in the reform of both Higher and Primary Education in the United Kingdom – a *'formal aesthetics* of behavioural psychology ' – a troubling reformulation and deployment of formalist techniques to the ends of producing an automatic subject appropriate to crisis capitalism's instrumental needs.

The formalism of the institutional psychology on which he [Michael Gove] indirectly draws is expressed in its assertion that the maximisation of 'learning' outcomes can be achieved by the establishment of an interest *type* that has nothing to do with the desires or preferences of the person to whom 'interest' is ascribed. This may seem to suggest the separation or the 'autonomy' of the learning process from economic affairs, but it doesn't require Georgi Plekhanov to see that in a world where the majority of people are forced to perform work in relation to which they feel little or no *personal* concern, the primacy of economic ends is reaffirmed even by the cultivation of those kinds of formal or 'cognitive' interest that appear to contradict it.[40]

In this new recuperation of formalism, its slow revival via behavioural psychology, content is firmly detached from 'interest'. The technical difficulty of a task is bound up in its impediment.

'Cognitive' interest can be raised by various kinds of obstructions, lacunae, and difficulty, and indeed often must be so raised, if an object is to be permanently imprinted into the human 'memory system'. In other words, 'comprehension and memory performances will generally increase' when the mind is presented with the sorts of obstacles and uncertainties that 'art' in general, and narrative art in particular, might be expected to induce. Art is the great maximiser of human memory performances.

In the 'cognitive processing' of causal sequences, the mind will experience more 'interest' wherever it is given a certain amount of work to perform on its own behalf. Artworks, speech acts, or didactic exercises that are gracious enough to allow an addressee to perform 'cognitive bridging inferences' will in general prove to be more 'interesting' than performances where the links in a causal chain are already preestablished.[41]

## Attention Accumulated

It remains unclear how exactly one might map this instrumental use of formalism back onto its origins in a, then, uninverted guardedly purposeless purpose by which aesthetic technique might make 'perception long and 'laborious''? It is clear that purposelessness can easily be derailed by purpose and that anything that does not kill capital completely might be used by it against itself. Furthermore, we might return to Marx once more to establish that the relation between difficulty and attention was not originated in aesthetics, but in the labour process itself: At the end of every labour process, a result emerges which had already been conceived by the worker at the beginning, hence already existed ideally. Man not only effects a change of form in the materials of nature; he also realizes [verwirklicht] his own purpose in those materials. And this purpose he is conscious of, it determines the mode of his activity with the rigidity of a law, and he must subordinate his will to it. This subordination is no mere momentary act. Apart from the exertion of the working organs, a purposeful will is required for the entire duration of the work. This means close attention. The less he is attracted by the nature of the work and the way in which it has to be accomplished, and the less, therefore, he enjoys it as the free play of his own physical and mental powers, the closer his attention is forced to be.[42]

Shklovsky said 'Art converts the particularities of things into perceptible form.'[43] And, 'Art processes the ethics and world view of a writer and liberates itself from his original tension. Things change when they land in a book.'[44] It is important to keep in view the historical aspect of formalism in view, by which not only are 'things' defamiliarised, but language and thus literature too.[45] This is Shklovsky's fundamental innovation. Rather than establishing a stability between literature and its object, or criticism and its object (literature), means and object instead become unstable, dynamic and poetic, emphasising that the process of automatism – automatic perception, habituation – which is itself a dynamic invariant in industrial culture finds an equally dynamic force of opposition in art (and this is especially so if we think of art, film, literature and music all at once).

## Autopoiesis  and Autonomisation

It is therefore important to keep in view the multi-perspectival aspect of formalism, by which not only are 'things' defamiliarised, but language and thus literature and criticism itself. In this sense, it is contains the truth-content which Theodor Adorno ascribed to art, by which 'art has a cognitive content, albeit a content which cannot in any simple way be extracted in a series of propositions.'[46]

Art, for Adorno, therefore demands attention in a way which overcomes either formalism or relativism, which challenges the division of art and science. This cognitive aspect of art and its proximity to concepts in psychoanalysis were developed by Fèlix Guattari as aspects of autonomisation in the work of Shklovsky's contemporary Mikhail Bakhtin: the idea of irreversibility of the aesthetic object and implicitly the idea of autopoiesis, pedagogy, psychiatry, and more generally to a social field devastated by capitalist subjectivity.

According to Bakhtin, in this movement the 'consumer' in some way becomes co-creator; the aesthetic form only achieving this result through the device of an isolating or separating function of such a kind that the expressive material becomes formally creative. The content of the work of art detaches itself from its connotations that are as much cognitive as aesthetic: 'isolation or detachment relates not to the material, not to the work as thing, but to its sig-

nificance, to its content, which is freed from certain necessary connections with the unity of nature and the unity of the ethical event of being.' There is thus a certain type fragment of content that 'takes possession of the author' to engender a certain mode of aesthetic enunciation. In the domain of poetry, in order to detach itself, autonomise itself, culminate itself, creative subjectivity will tend to seize upon:

1. the sonority of the word, its musical aspect;
2. its material significations with their nuances and variants;
3. its verbal connections;
4. its emotional, intonational and volitional aspects;
5. the feeling of verbal activity in the active generation of a signifying sound, including motor elements of articulation, gesture, mime; the feeling of a movement in which the whole organism together with the activity and soul of the word are swept along in their concrete unity. And it is this last aspect, declares Bakhtin, that encompasses all the others.[47]

## Conclusion: Final Separation

According to Jameson, in Shklovsky's work, '[...] we are made to realize the incommensurability of words to experience, of models to lived existence ... segments of events are fragmented to the point where the infinite divisibility of all human experience in time seems a demonstrable fact.'[48] The emphasis on time, divisibility and non-equivalence is suggestive of aesthetics and art as an invariant counter-movement to capitalism's dynamism. While Jameson's account is half celebration of resistance and half lament, it seeks to pose an impossible unity which could both represent and overcome capital's own totality, Shklovsky's emphasis of the particular and incommensurable suggests an ever closer interrelation of art and life which maintains each as separate and, only just, autonomous in its proximity. As such, littered with use values thrown out of their habitual context, Shklovsky's prose (even ironically during his most 'productivist' phase in his work for the cinema at Goskino) extends and rigorously defends inutility in art and life.[49] There is no moment, either in his theoretical or prose writings, which almost always overlap, when Shklovsky is anything other than committed to the demands of the present, his time, his epoch, however contrarian, ironic or even perverse a position he finds from which to respond to its exigencies. Aesthetic activity resists capital's total unfreedom by failing to be totally free – it is bound to the constraining rigours of the aleatory enquiry of art and thereby unbinds itself from mastery and domination by which capitalism poses concrete labour as the bearer of the universal equivalence of value. There is simply no way to bring art inside social confrontation without deforming or instrumentalising it. Yet, if social confrontation initiates a process as indifferent to the valorisation of value, as aleatory as art, as concerned to preserve the separation of human life from its functional destruction as labour power then there is a possibility for social struggle to ally itself to art's concerns without either collapsing completely into the other.

## Notes

1. I shall in this text omit discussion of more recent use of the term by French philosopher Jacques Rancière and several English theorists of aesthetics: Stewart Martin and Gail Day, this more specifically aesthetic discussion will have to unfortunately be postponed until another opportunity arises.

2. Sadly I'll not there is not sufficient space to introduce fully Gillian Rose's critique of this term, 'reification', as analysed in her text 'The Lament over Reification', which could give a significant qualification to aspects which Jameson emphasises and would help temper some obvious romanticism and 'vitalisms' of this and other positions discussed. Gillian Rose, 'The Lament over Reification', in *The Melancholy Science,* London & Basingstoke: Macmillan Press, pp.27-48.

3. Fredric Jameson, 'Culture and Finance Capital', in *Critical Inquiry,* vol. 24, no. 1 (Autumn 1997), p.259.

4. Siegfried Kracauer, *The Mass Ornament,* Cambridge Mass. & London: Harvard University Press, 1995, pp.78-79

5. Harry Braverman, *Labor and Monopoly Capital*, New York, 1974, p.86.

6. Ibid., p.87.

7. Vladimir I. Lenin, "The Taylor System—Man's Enslavement by the Machine", http://www.marxists.org/archive/lenin/works/1914/mar/13.htm Accessed November, 2012.

8. Vladimir I. Lenin, "The Immediate Tasks of the Soviet Government" (1918), *Collected Works*, vol. 27 (Moscow, 1965), p. 259. Quoted in Harry Braverman, *Labor and Monopoly Capital* (New York, 1974), pp. 8-9. See also Robert Linhart, *Lénine, Les Paysans, Taylor* (Paris, 2004). Available: http://archive.org/details/LenineLes-PaysansTaylor Accessed November, 2012.

9. Anson Rabinbach, *The Human Motor: Energy, Fatigue and the Origins of Modernity* (New York, 1992), p.272.

10. See: Michael Seidman, *Workers Against Work: Labor in Paris and Barcelona during the Popular Fronts* (Berkeley, 1991), p.11; Anson Rabinbach, *The Human Motor: Energy, Fatigue and the Origins of Modernity* (New York, 1992), pp.272-275; Jacques Rancière, 'From Pelloutier to Hitler: trade unionism and collaboration' in *Staging the People: The Proletarian and His Double, (Staging the People, Vol.I)*, London: Verso, 2011, pp.169-170.

11. For an extended discussion see: John Willett, *Brecht in Context*, London: Methuen, 1984 and Owen Hatherley, 'Who's afraid of the *Verfremdungseffekt?' in Militant Modernism,* London: Zero Books, 2008.

12. Ibid., p.220

13. From the Translator's Introduction by Benjamin Sher, Viktor Shklovsky, *Theory of Prose,* [Trans. Benjamin Sher], Illinois: Dalkey Archive, 2009, p.xix.

14. Viktor Shklovsky, Theory of Prose, (trans. Benjamin Sher) Illinois: Dalkey Archive, 2009, p.6.

15. Ibid., p.4.

16. 'I am studying unfreedom as though it were a set of gymnastic equipment. [...] It is essential to seek out methods. To find a way of studying unfreedoms of a different type.' And later: 'A work of literature lives on material. *Don Quixote and The Minor* owe their existence to unfreedom. It is impossible to exclude certain material; necessity creates works of literature.' Viktor Shklovsky, *Third Factory,* pp.40-41 and pp.8-9..

17. Carla Benedetti, *The Empty Cage: Inquiry into the Mysterious Disappearance of the Author,* New York: Cornell University Press, 2005. pp.117-118.

18. Viktor Shklovsky, 'Art as Device', op.cit., pp.4-5.

19. Frederic Jameson, 'Culture and Finance Capital', p.259.

20. A key example would be May 2010's Wall Street 'flash-crash'. This theme is explored extensively in a recent issue of *Mute* magazine, Mute Vol. 3, No. 4 - Slave to the Algorithm, http://www.metamute.org/editorial/magazine/mute-vol.-3-no.-4-slave-to-algorithm see specifically articles in this issue: Inigo Wilkins and Bogdan Dragos, 'Destructive Destruction? An Ecological Study of High-Frequency Trading', http://www.metamute.org/editorial/articles/destructive-destruction-ecological-study-high-frequency-trading and Alberto Toscano, 'Gaming the Plumbing: High-Frequency Trading and the Spaces of Capital', http://www.metamute.org/editorial/articles/gaming-plumbing-high-frequency-trading-and-spaces-capital Accessed January, 2012.

21. The origins of the punched card begin with their use in textile looms of the 18th century, widespread use throughout the 19th century for all kinds of larges-cale machines, then from the early-20th century onwards as the primary medium for data entry and storage in data processing. See: http://en.wikipedia.org/wiki/Punched_card

22. Romano Alquati 1963, trans. Matteo Pasquinelli, quoted in Matteo Pasquinelli, 'Machinic Capitalism and Network Surplus Value: Towards a Political Economy of the Turing Machine', *unpublished.* Draft, p. 6, http://bit.ly/nljAVo

23. Benedict Seymour, 'Short Circuits: Finance, Feedback and Culture', Mute, vol.3 #1, http://www.metamute.org/editorial/articles/short-circuits-finance-feedback-and-culture

24. Bernard Stiegler, *For a New Critique of Political Economy,* Cambridge: Polity Press, 2010, p.33.

25. Stiegler's conceptual framework is heavily reliant on the work of Gilbert Simondon and the following critique of Simondon by Alberto Toscano can be extended to aspects of Stiegler's own work in this field, especially it's lack of critical discourse on capitalism: 'Simondon's philosophy of 'technical culture' sought to neutralize the bond between antagonism and productivism which he regarded as the fatal platform for the politics of the Cold War. [...] Simondon's investigations on the technical object must be read as an attempt to evade the discourse of capitalism and the critical discourse on capitalism, by means of a thinking which refuses the paradigm of labour in order to seek in the technical and scientific activity of invention the key to a new genesis of the collective life. [...] To put it differently, and in terms dear to both Marx and Negri, by treating the subsumption of technology to capital as formal rather than real or ontological, Simondon loses the means of thinking the contemporary convergence of invention and work, an indiscernibility that still requires an understanding of the sociogenetic function of exploitation. In other words, the configuration of ontology and politics cannot evade the manner in which the 'real abstractions' of capitalism – money, value,

abstract labour – mould the very being of machines, inventions and subjects.' Alberto Toscano, 'The Disparate: Ontology, Politics, Simondon', Paper delivered at the Society for European Philosophy/Forum for European Philosophy annual conference, University of Sussex, 9 September 2007, http://www.after1968.org/app/webroot/uploads/Toscano_Ontology_Politics_Simondon.pdf

26. Jacques Camatte, *This World We Must Leave,* New York: Autonomedia, p.139.

27. Jacques Camatte, *This World We Must Leave,* op. cit., p.139.

28. Ibid., p.141.

29. Tomas Nielsen Rotta and Rodrigo Alves Teixeira, 'Marxian Theory of Financialisation of the U.S. Economy', http://www.sep.org.br/artigo/6_congresso/2510_399bd934f1de4cc35bdfe9be2404a9ce.pdf

30. Jacques Camatte, *This World We Must Leave,* New York: Autonomedia, p.139

31. Karl Marx, *Capital*, Vol.1, (Trans. Ben Fowkes), London: Penguin, 1990, p.545

32. 'Capital itself is the moving contradiction, [in] that it presses to reduce labour time to a minimum, while it posits labour time, on the other side, as sole measure and source of wealth. Hence it diminishes labour time in the necessary form so as to increase it in the superfluous form; hence posits the superfluous in growing measure as a condition – question of life or death – for the necessary. On the one side, then, it calls to life all the powers of science and of na¬ture, as of social combination and of social intercourse, in order to make the creation of wealth independent (relatively) of the labour time em¬ployed on it. On the other side, it wants to use labour time as the meas¬uring rod for the giant social forces thereby created, and to confine them within the limits required to maintain the already created value as val¬ue. Forces of production and social relations—two different sides of the development of the social individual – appear to capital as mere means, and are merely means for it to produce on its limited foundation. In fact, however, they are the material conditions to blow this foundation sky-high.' Karl Marx, Grundrisse, Penguin, London 1993, pp.704–706.

33. Jacques Camatte, *This World We Must Leave,* op.cit., p.161.

34. Théorie Communiste (Roland Simon), 'The Present Moment', SIC: International Journal for Communisation, Issue 1, http://riff-raff.se/en/sic1/sic-1-07-the-present-moment.pdf also available at http://libcom.org/library/present-moment-theorie-communiste.

35. Ibid.

36. Theodor Adorno, *Aesthetic Theory*, p.54 (Athlone edition)

37. Theodor Adorno, Ibid., p.28.

38. Moishe Postone, *Time, Labour, Social Domination*, New York and Cambridge: Cambridge University Press, 1993, p.215.

39. Viktor Shklovsky, *The Energy of Delusion: a Book on Plot',* Illinois: Dalkey Archive, 2011, p.3.

40. Danny Hayward, 'Keeping Up With the Pavlovs', *Mute,* http://www.metamute.org/editorial/articles/keeping-pavlovs

41. Ibid.

42. Karl Marx, *Capital,* Vol.I, op.cit., p.284.

43. Viktor Shklovsky, 'Letter to Tynyanov', *Third Factory,* op.cit., p.xix.

44. Viktor Shklovsky, 'On the Freedom of Art' quoted in *Third Factory,* op.cit

p.xviii.

45. These points lean heavily upon the analyses of Carla Benedetti, *The Empty Cage: Inquiry into the Mysterious Disappearance of the Author,* op.cit., pp.121-122.

46. Simon Jarvis, *Adorno: a Critical Introduction,* Cambridge: Polity Press, 1998, p.90.

47. Félix Guattari, 'On the Production of Subjectivity', in *Chaosmosis: An Ethico-Aesthetic Paradigm*, Bloomington, Indiana: Indiana University Press, 1995, pp.14-15. Quotations in this passage are from Mikhail Bakhtin, 'Content, Material, and Form in Verbal Art', in *Art and Answerability: Early Philosophical Essays by M.M.Baktin,* edited by Michael Hoquist and Vadim Liapunov, Austin: University of Texas Press, 1990, pp.306-307.

48. Frederic Jameson, *The Prison-House of Language,* op.cit., p.77.

49. 'First of all, I have a job at the third factory of Goskino. Second of all, the name isn't hard to explain. The first factory was my family and school. The second was Opoyaz. And the third – is processing me at this very moment.' Viktor Shklovsky, *Third Factory,* op.cit, pp.8-9.

# Contagious Architecture:
# Computation, Aesthetics and Space[1]

**Cybernetic thought**
**(Chapter 3. Architectures of Thought)**

In 1968, for the "Cybernetic Serendipity" exhibition curated by Jasia Reichardt at the ICA (London), cybernetic scientist and architect Gordon Pask invented a computational architecture of thought. Long before the construction of the digital computer, Pask's interests in cybernetics had led him to explore the role of feedback in defining the space of thought, and he drew in particular on the cyberneticist view that cognition could be understood in terms of neural structures that learn and adapt to the environment.[2]

By the late 1950s, Pask had constructed several electrochemical devices that possessed the ability to deploy their own sensors and thereby establish a relationship between their internal states and the external world. These devices were designed to evolve an increased sensitivity to sound or mag-netic fields. Most famously, he built the MusiColour machine: a light show that responded to sound. This machine was programmed to become bored when it could not react to the music performed, thus forcing the musician to change his composition in order to reincite the system's response.

Importantly, the MusiColour machine anticipated the theory of enactivism, as it already suggested that the evolution of a cognitive system entailed interaction with its environment. However, Pask believed that elements of interaction for both biological and cognitive systems had to be grown in great numbers, so that large-scale adaptive networks (analog and digital) could potentially be built through interactive feedbacks. Against the architectural conception that a cognitive system grows from a fixed point of view, Pask's work proposed a materially embedded set of observable relations that change over time. Architectures of thought emerged in his work from the interaction of elements within the world, through

which measurements were made, distinctions were drawn, and concepts were formed. For Pask, intelligent behavior is a craft and cannot be exhausted by computational programming. Given that intelligence cannot be preset — i.e., that it is not an internal property of either the head or the mechanical box, but rather what emerges from interactions — Pask insists on the priority of physical relations, as the latter are defined by degrees of constraint and freedom. In other words, it is not computation but only biophysical and chemical interactions that can generate architectures of thought beyond any given set of rules. According to Pask, however, these interactions also need to account for the hierarchy of goals and actions, which he defines as objective interactions, as well as peer-to-peer language exchanges or subjective interactions. In particular, the rules of interaction are part of his "Conversation Theory", in which he lists the reasons why principles of agreement, understanding, and consciousness are crucial for the devising of human-to-human, human-to-computer, and computer-tocomputer interactions. Away from the on/off logic of computation, Pask conceives of interaction as a conversation that requires mutual actions, such as those performed in dance, where space is offered to the steps of other bodies. Pask's model already foresaw that information transfer and data structures were the new platforms for the future of computational architecture. He was not concerned with inputting information into a body, but rather with showing that the interactive qualities of agreement, understanding, and consciousness were emergent properties of enacted environments.

Pask's experiments with mechanical and electrochemical systems also provide a conceptual framework for building a responsive architecture allowing human and media to coexist in a mutually constructive relationship.[3] For Pask, architecture is a cybernetic system that can learn, like the brain, to adapt and change through a creative conversation between the building and its users. The adaptive architecture that he proposes, however, is also a computational entity (an analog computation) that is able to learn, like the MusiColour machine, from its states, and can make suggestions as to its own reorganization and the reactivation of its spatial capacities. This cybernetic architecture, which includes the possibility of constructing a digitally controllable structure that can transform its uses according to changing circumstances, can also be conceived as an instance of the "anticipatory architecture" that I discussed in chapter 1. However, despite the degree to which it anticipates the notions of responsiveness and participation that now characterize interactive architecture, this conception of a thinking building needs to be distinguished from the design of smart environments. For instance, like the late 1990s MIT design project Intelligent Room , an example of smart architecture possessed of cognitive capacities that can be equated to the computational performance of algorithms (for which cognition equates to action),[4] Pask's experiments in adaptive architecture can be seen to suggest that the building's interaction with the environment would primarily lead to a thinking space. However, the Intelligent Room project deploys a neuroarchitectural understanding of space, with computation seamlessly deploying automated activities driven by interactive algorithms that are designed to respond to or act out the environment according to inputs (e.g., movement triggering the switching on of light, sound triggering the shutting of curtains, etc.). This form of response to input entails that the thinking of doing something and the actual doing of it can be summed up or synthesized by one sensorimotor action. In short, the simple switching off of the lights when leaving a room becomes an automatic response.[5] This is an instanta-

neous form of interaction, which is primarily reactive as it implies that the environment acts at the same time as the person within it.

The design of the Intelligent Room is inspired by early models of cybernetics, according to which environments can become intelligent, responsive, or interactive either if algorithmically programmed to do so, or if an intelligent behavior emerges out of neuroalgorithmic connections. It is not a surprise that interaction is governed in this example by building manage-ment operators, which are for example preset to optimize sunlight distribution so that rooms can change color as people enter. Yet for Pask, this kind of ideal interaction would simply involve the preprogramming of environments in such a way that they instantaneously respond to people, without ultimately allowing for a self-organizing architecture able to establish a truly dynamic conversation with its inhabitants. Such a dialogue would require the entire organizational structure of the architecture to change. Pask conceives of input criteria as fine-tuned variables that change according to contingent circumstances, and does not therefore see them as preset variations or probabilities of interaction that can be applied to humanmachines. The entire interactive environment (and not just the computer or the participant) is therefore required to select and construct its own input criteria, its abstract objects for potential actualization. From Pask's point of view, it is only when this interactive environment is conceived dynamically that the occupants can be said to enter new levels of engagement, insofar as they become agents of the evolution of their own inhabited space.

It is therefore clear that Pask's architecture of thought is defined by interactive dynamics grounded in the material world of electrochemical assemblages, the crafting of building links and assemblages, and the designing of tools that people themselves may use to construct their own data environments.[6] Pask is thus more than a pioneer of neuroarchitecture, as his cybernetic architecture of thought clearly embraces second-order cybernetics, i.e., notions of self-organization, adaptation, and the capacity of the structural arrangement of space to change by learning from feedback with the environment. From this standpoint, his cybernetic architecture stands apart from the mathematical vision according to which the mind is composed of a priori formal axioms, and engages directly with the environmental intelligence of the physical, chemical, material world. Pask devised a series of architectures of thought that were intended to be openended spaces for learning by interaction,[7] based on dynamic conversation between communication environments and their inhabitants, in which humans and machines could work together to form a self-emergent system that enacts cognition. In other words, his cybernetic architecture seems to be closer to enactivism than to neurocognition. On the other hand, despite his engagement with a cybernetic mode of computational thought, the centrality of the notion of feedback as a reversible relation between the environment and the building (a relation that ultimately leads the building to adapt, change, and thus think through learning) does not give us much opportunity to explain what is at stake as regards the proposition of an algorithmic mode of thought. Although Pask's projects involved a series of experiments with biological, chemical, and mechanical modes of thought, the computational dimensions of digital space have remained secondary, as this space seems to be unable to change without becoming coupled with the external environment or a substantial substrate. This tendency to embody thought or to embed it within the environment is also evident in contemporary works developed from or inspired by Pask's legacy. For instance, at the recent exhibition "Pask

Present",[8] Richard Roberts's work Hearing a Reality[9] proposed an embodied version of conversation that was triggered by the movement of people circling around an acoustic device. Not only does Roberts show that there is an analog computation of experience between the people and the device: in addition, this project suggests, that experience is deployed by a system of interaction that is able to learn from its environment. The project thus becomes an instance of enacted cognition and embedded thought. On the other hand, projects such as KRD's (Kitchen Rogers Design) Responsive Space show how the environment undergoes transformations of its own shape when prompted to do so by the visitor's movement.[10] Here individual movement directly molds the form of the space. For example, such movement can cause the ceiling to slide 2,100 mm up and down and to tilt from side to side, so as to completely transform the space's form from within. Sensors scattered in the space, which continues to remain mobile because its volumes are ceaselessly altered by random sensorimotor responses, act as catalysts for the transformation of the room.

It may seem that these interactive architectures contradict the standpoints of neuroarchitecture, insofar as space is activated here through and by sensorimotor activities. Yet it is important to stress that this particular project aims to show that the shape of the space, i.e., the computed environment, is itself in movement, and is reconfigured each time by an unscripted enactment. The stainless steel floor and walls are equipped with invisible sensors that are ready to pick up sensorimotor stimuli, and compute the space through live response. KRD therefore offers a model of interaction based on the sensorimotor enactment of space, where the interior form of the room remains attuned to the variables of lived movement. These movements seem to constitute the movement of cognition as the sensorimotor activation of neural space. In other words, the movement of cognition is here implied to be equivalent to sensorimotor action. As Maturana and Varela point out, "cognition is a matter of interacting in the manner(s) in which one is capable of interacting, not processing what is objectively there to be seen. Living systems are cognitive systems and living is a process of cognition."[11]

From the standpoint of neuroarchitecture, however, Hearing a Realit y and Responsive Space do not explain how the embedded computation of space modulates or impacts cognitive behavior. At the same time, neuroarchitecture also fails to explain that space does not preexist experience, and that the emphasis of enactivism on sensorimotor adaptive response points to the co-constitution (interactive coupling) of experience and space. Nevertheless, what is still missing from these articulations of interactive cognition is that thoughts are also abstract objects. This means that thoughts are internally related and externally disconnected, and thus enjoy a spatial order or architecture that does not match the physical order of space. These interactive projects, therefore, overlook — to a greater extent than Pask's experiments in chemical, biological, and physical computation — the sense in which the actual modalities of information are infected with abstract sonic objects, for instance, or with volume infinities. The notion of the cognitive character of information employed in these projects (unlike in Pask's) does not entail a learning or growing form of computation that stems from interactive elements. Instead, they remain far more literally identical to the visitors ' physical movement. In consequence, the interaction between information and bodies is conflated here into one system of action and reaction, insofar as the movement of bodies becomes equivalent to information. The biophysical dynamics of moving bodies here simply performs cognition as

information emerging from sensorimotor inputs. In contrast, Pask's cybernetic computation shows the processual or the retroprocessual learning of the various elements of the architectural structure to be defined by the interaction of chemical, mechanical, and physical elements whose temporal and multi-layered recurring functions can give rise to the cognitive dynamics of the structure. From this standpoint, Pask's cybernetic architecture conceives the environment in a manner similar to enactivism, i.e., as being constitutive of but also as constituting the cognitive structure of thought. In the next section I will discuss this ecological understanding of cognition at more length, observing that Pask's cybernetic architecture offers a view of computation that considers the latter in terms of an environment: as an information background that affords a direct link between perception and cognition. Before turning to the ecological understanding of information, it may be important here to point out how cybernetics, and in particular Pask's articulation of interaction, can help us to challenge notions of interactivity that rely directly on the algorithmic processing of sensorimotor responses. In other words, Pask's notion of interaction significantly contributes to developing a theory of contingency in computation. Since his computational experiments were more closely engaged with biophysical and biochemical processes of computation, it would also seem that his experiments have little to add to the notion of soft thought that I want to develop here.

Yet if we turn to an ecological understanding of information, it may perhaps be possible to resolve this issue, as we will be led toward a mereotopological understanding of information that does not imply that one mode of computation — one mode of thought — can subsume all others.

## Ecological thought
## (Chapter 3. Architectures of Thought)

To understand cognition in terms of information environment one has to turn to James J. Gibson, who argued that information is itself an environment and not just one element of interaction to be added to another. In the 1970s, Gibson developed a notion of information that departed from the rule-centered computational model, observing that information could only be picked, selected, and explored from the environment, not communicated to a receiver.[12] Information, therefore, is an environment that is directly perceived: a world of data that are readily available to selection. This is why perception and cognition, according to Gibson, explain how being-in-the-world has nothing to do with a mechanism of input and output or a measure of probabilities in the communicating system. Similarly, knowledge does not correspond to a cognitive state that is generated in the head. Knowledge is a process of experiencing data that is located not in the brain but in the muscles of perception.[13]

By placing cognition in the environment, Gibson proposed an ecological approach to thought. This approach primarily questioned the assumption that in order to perceive the world one must already have ideas about it. This means that his theory rejects the assumption according to which we would only be able to perceive responsiveness if the idea of interactive space were already formed in our heads. Against this view, Gibson explained that only an immersive perception of the environment — and not its pregiven conception — could give us a veritable knowledge of space. Through the extraction of abstract invariants from an information flux or through the perceptive selection of data from a continuous background of information it is possible, according to Gibson, to form knowledge of the qualities of

objects.[14] For Gibson, cognition is dependent on a background environment that is pregnant with information. This background persists in perception, experience, and knowledge even when it remains out of sight. In other words, the abstract architecture of an object is experienced even when, and especially when, it remains imperceptible, removed from the present situation, or unselected by an actual occasion. For instance, if the interactive space of Hearing a Reality were to deploy the invisible potentialities of sonic space through physical movement, then the conditions of experience might have to be minutely crafted to include blind spots of sound, unhearable beam objects that could affectively trespass all sonic orientations. Only by including such humanly unhearable realities of sonic objects could the structure of experience become not just interactive but immanent to the informational environment in which perception and cognition are lodged.

As opposed to the sensation-based approach to perception, according to which anything out of sight can only be perceived through an image (i.e., recalled, imagined, conceived) but not directly experienced, Gibson sustains that any occluding edge is instead part of direct perception.[15] Opaque surfaces are not invisible, but are perceived as being one behind another, entering and exiting from sight as the observer moves in one direction and then in another. In particular, Gibson argues that the briefest and the longest instances of locomotion (e.g., a movement that lasts fractions of a second, or one that lasts hours) deployed the possibility of perceiving the invisible as such. He calls this possibility "reversible occlusion", because only movement and its reverse can explain this possibility.[16] As there is an underlying invariant structure, a continuity of all surfaces, the difference between the hidden and the unhidden can be explained as a short or long pause in locomotion.[17] Conceived in these terms, the physi-

cal movement in Hearing a Reality could for instance account for the relation between the hearable and the unhearable as part of an underlying architecture of sonic information, rather than focusing on an actual sonic space designed to be heard by a human ear.

Hence the information background is here a topological invariant of the energy-light itself, which is brought to the foreground by the selective activity of perception. In other words, the direct perception of invisible objects makes them visible. However, the computational version of this background in projects such as Responsive Space seems to be missing, because here volumetric information always already coincides with actual and not potential movement. One may then wonder how interactive projects such as Responsive Space can really include this topological continuity of information background. Can it unite all surfaces affording a genuine perception (selection and creation) of data space, so as to foreground unexpected variables in experience? Wouldn't the closed nature of programmed responses or the computational background always already delimit the sensorimotor knowledge of what potential responsiveness could become? It is true to say that Gibson's ecological approach has the advantage of deterritorializing cognition for a subject perceiving, but also for a neural network computationally performing thought. This approach in fact does explain that information is environment, an always-experienced background.

Yet Gibson argues that this background is not computational. Rather, it is defined as an inexhaustible continuous energy-information environment that affords the perception of being-in-the-world. That is to say that although information is in the background, i.e., within the environment from which it is picked, there is always already a perceiving entity, which is here posed as the actor of cognition. De-

spite suggesting that cognition is not computation and that it is a capacity afforded by the environment (an enaction of the selected information), Gibson's ecological approach nevertheless discards the idea that the persistence of the information background reveals, beyond direct sensorimotor perception, the exhaustion of this potential in actual combinations. Arguing against the view that the continual flow of potentiality — the infinitesimal infinity of topological invariants — constitutes the ontological background of actualities, Whitehead instead explains that eternal objects (background potentialities) do not exist as one uninterrupted surface that can be directly experienced by a body even when it is out of sight, but are discrete infinities, externally unrelated and negatively prehended. To put it in another way, as I discussed in chapter 2, Whitehead proposes a mereotopological matrix of eternal objects to explain that infinities are discrete dynamics, since they are not merged with one another through transcendent principles. In addition, eternal objects are also discontinuously selected by actual occasions, in which they can acquire real togetherness or unity of complexity and through which they exhaust their discrete infinity by becoming one with finite actualities. Hence experience is not just the foreground of the continual background of information. On the contrary, an occasion of experience demands that these discrete infinities become determined twice: first according to the (positive and negative) prehensive modality of ingression into an actual occasion, and second according to the new togetherness that they come to actually enjoy as selected potentials. Similarly, not only does the background of potentials become determined when selected by actual occasions: it is also determined according to the infinite levels of interior relations between infinities. The background is not an inexhaustible pool of energy-information waiting to become realized in perceptual experience. This background instead deploys the mereotopological architecture of parts and wholes that cannot be summed up by topological invariants or a priori continuity between otherwise discrete infinities. This background therefore is a mereotopology of eternal objects, of unrealized and unrealizable eternal objects that are nonetheless immanent to experience as contingent modes of thought, of which there are many. In other words, eternal objects are lived abstractions.[18] Here cognition is not derived from physical perception but is determined by the conceptual prehensions of eternal objects. In particular, cognition, understood in this sense, does not imply the sensorimotor activity of perception, but rather corresponds to a conceptual or nonsensuous feeling characterized by the "entertainment of unexpressed possibilities."[19] To sum up: while embracing Gibson's ecological notion of information, I instead suggest that the information background is a mereotopology of infinite parts of infinities, incomputable objects, which are immanent to and further determine occasions of experience as lived abstractions.

At the same time, the discontinuous relation between eternal objects and actual occasions is intersected by another level of discontinuity. Algorithmic prehensions cannot be said to derive from physical embodied perception, and yet they do not correspond to finite sets of data either. An algorithmic conceptual prehension is nonphysical and characterized by "the sense of what might be and what may have been. It is the entertainment of the alternative."[20] In short, what is problematic with the ecological approach and its autopoietic overtones is its tendency to conflate information either with finite sets of algorithms (closed computation) or with a background of infinite potentiality (a whole of continual variations), without explaining how information as quantification can be directly conceived

in terms of qualities. In addition, this anticomputational approach does not offer much opportunity for theorizing thought beyond theories of embodied cognition. This approach will therefore exclude the existence or actuality of a computational mode of thought, as computation remains defined here in terms of finite sets of probabilities, and this reduces thought to statistical operations. Against this view, I will suggest that the actuality of soft thought is determined by incomputable quantities that have irreversibly infected the "qualculative" background of experience. It is the algorithmic contagion with infinities that transforms these finite sets of data into discrete infinities and also discloses another variety of infinity to the structure of experience: unsynthesizable quantities that correspond to interferences rather than to embodiments of thought.

## Notes

1. There are 2 parts included in the publication, "Cybernetic Thought" and "Ecological Thought", of chapter 3. "Architecture of Thought" of the Luciana Parisi's book "Contagious Architecture: Computation, Aesthetics, and Space"

2. Warren S. McCulloch and Walter Pitts's paper "A Logical Calculus of the Ideas Immanent in Nervous Activity" was written to demonstrate that a Turing machine program could be implemented in a finite network of formal neurons and thus that the neuron (or the mathematically abstracted neural function) was indeed the base logic unit of the brain. Their artificial neuron (abstracted from the neurophysiological structure of the brain) strongly contributed to the development of neural network theory, but more significantly contributed to the development of a cybernetic view of computation, which eventually led to ideas of self-organization defined by adaptation and learning. This paper therefore reveals the impact of cybernetics on computation as being concerned not with symbolic manipulation of data, but with the architectural form of the brain. See James A. Anderson and Edward Rosenfeld, eds., *Neurocomputing*, vol. 1, *Foundations of Research* (Cambridge, MA: MIT Press, 1989), 15 – 18. Pask's cybernetic brain experimentation further contributed to the artificial development of biological neurons. The *Musi-Colour* machine, for instance, used banks of lights as biological neurons, which would be activated when and if the output exceeded a certain threshold value that changed over time. See Pickering, *The Cybernetic Brain*, 316.

3. See John Hamilton Frazer, "The Cybernetics of Architecture: A Tribute to the Contribution of Gordon Pask," *Kybernetes* 30, nos. 5 – 6 (2001), 641 – 651. The article discusses Pask's contribution to the development of environmentally responsive architectural theory.

4. R. A. Brooks, M. Coen, D. Dang, J. DeBonet, J. Kramer, T. Lozano-P é rez, J. Mellor, P. Pook, C. Stauffer, L. Stein, M. Torrance, and M. Wessler, "The Intelligent Room Project," Proceedings of the Second International Cognitive Conference (CT 1997), Aizu, Japan, August 1997, available at http://www.ai.mit.edu/projects/aire.orig/publications/ (last accessed January 2012).

5. On the MIT *Intelligent Room* project, see Michael Coen, "The Future of Human-Computer Interaction or How I Learned to Stop Worrying and Love My Intelligent Room," *IEEE Intelligent Systems* (March-April 1999), available at http://people.csail.mit.edu/mhcoen/Papers/stopworrying.pdf (last accessed January 2012).

6. See Usman Haque, "The Architectural Relevance of Gordon Pask," *Architectural Design* 77, no. 4 (July-August), 54 – 61. In this context, the stealing or reappropriation of software, for instance, may also count as a way of developing tools of interaction that build new data environments through a veritable conversation between distinct software structures. On the aesthetics of interaction as the reappropriation of distinct software, see the work of digital media artist Cory Arcangel. In particular, see projects such as the *Infinite Fill Show*, 2004. See "Columbia University Art and Technology Lectures," December 16, 2006, available at http://www.columbia.edu/itc/soa/dmc/cory_arcangel/ (last accessed January 2012).

7. For a more detailed discussion of Pask's pioneering views of interaction see Peter Cariani, "Pask's Ear and Biological Creativity," available at http://www.mav-

erickmachines.com/WordPress/wp-content/uploads/2007/07/petercariani.pdf (last accessed January 2012); Peter Cariani, "To Evolve an Ear: Epistemological Implications of Gordon Pask ' s Electrochemical Devices," *Systems Research* 10, no. 3 (1993), 19 – 33.

8. This exhibition was held at Atelier Farbergasse, Vienna, 26 March – 4 April 2008. Details of the exhibition can be found at http://paskpresent.com/exhibition/ (last accessed January 2012).

9. Roberts's installation consists of two steel plates that are physically attached to loudspeakers, one acting as a microphone, the other as a driver. An amplifier and monitoring system create an audio feedback loop with the environment. The movement of people around the device triggers the acoustic properties of the space, which change through differing oscillations. For a more detailed description of *Hearing a Reality* , see http://paskpresent.com/exhibition/?page_id=15 (last accessed January 2012).

10. KRD's project *Responsive Space* was designed for the Machine Exhibition at the Kelvingrove Gallery, Glasgow, in 1999. Documentation of this project is available at http://www.lucybullivant.net/html/showcase/publications/rogers.html (last accessed June 2012).

11. Humberto R. Maturana and Francisco J. Varela, *Autopoiesis and Cognition: The Realization of the Living* (Dordrecht: D. Reidel, 1980), 13.

12. James J. Gibson, *The Ecological Approach to Visual Perception* (Boston: Houghton Mifflin, 1979), 243.

13. Cognition can only start as an activity of perception, as deployed by the flowing array of the observer who walks from one vista to another, moves around an object and thus extracts from it the invariants that underlie a changing perspective, unearthing the connections between hidden and unhidden surfaces. Ibid., 303.

14. Gibson explained that nothing is copied in the light to the eye of an observer, not the shape of a thing, the surface of it, its substance, color, or motion, but all these things are specified in the light itself. Ibid., 305.

15. Gibson's notion of affordance entails a certain type of direct perception. For instance, images are not mediated by retinal, neural, or mental pictures. Direct perception instead gets information from the ambient array of light. Direct perception results from the exploration of what lies around things, leading vision to perceive a continuous background surface. Ibid., 35.

16. Ibid., 202.

17. Ibid., 86.

18. Brian Massumi argues for a notion of lived abstraction to explain the operations of concrete experience. In particular, he puts forward the notion of semblance to explain how events imply the experience of passing and how what passes corresponds to a lived abstraction. Brian Massumi, *Semblance and Event: Activist Philosophy and the Occurrent Arts* (Cambridge, MA: MIT Press, 2011).

19. Whitehead, *Modes of Thought* , 26

20. Ibid.

# Mayhem in Mahwah

# The Case of the Flash Crash;

# or, Forensic Reperformance in Deep Time

It must be the case that I have some perception of the movement of each wave on the shore if I am

to be able to apperceive that which results from the movements of all the waves put together, namely

the mighty roar which we hear by the sea.

—— Gottfried Wilhelm Leibniz[1]

### Automated Daemons

Shoot first, ask questions later.
—— Eric Hunsader[2]

When financial market prices plummeted and caused havoc on May 6, 2010, stock indices such as the Dow Jones Industrial Average and the Standard & Poor's 500 (S&P500) incurred enormous losses in record time, and even single company stock notations crashed to previously unknown low levels, only to rebound minutes later.[3] To quote but one of the many sources commenting on this global flash of financial pandemia, the event "carries the distinction for the second largest point swing, 1,010-points, and the biggest one-day point decline, of998.5-points, on an intraday basis in the 114-year history of the Dow Jones Industrial Average."[4]
It was not just traders with open positions who were caught off-guard and severely affected. What has

become known as the Flash Crash simultaneously sent a shockwave through wider business circles. Live on CNBC, for instance, TV newscast presenters and commentators were discussing the financial backgrounds of the severe protests taking place in Greece as a consequence of the credit crunch and the austerity cuts; but they seemed compelled to shift their attention increasingly to a financial event whose sheer magnitude left them stunned—the immense and unexpected drop in market prices occurring right before their eyes.[5] Clueless as to what had catalyzed the crash—economic data did not account for a blow of such ferocious violence—they resorted to idiomatic terms such as "capitulation."
Initially, the TV-screen showed live footage of the Greek insurgence in Athens meshed with economic data feeds and real-time market prices (a constant presence not only in today's business media)ticking away in a smaller window below. But the live broadcast of protesters pitted against police forces

gradually faded, with the discussion shifting in tone and content. Market charts began to fill the screen as the conversation plunged into an emotional debate about what specific contingency might have triggered the downward flood of transactions. The suggested speculative explanations included a "fat finger event" (a typing error), a breakdown of machines (a hardware failure), a software glitch, and rapid-selling action due to the European (and especially the Greek) credit crisis. One commentator was heard reiterating recommendations to buy because of the "ridiculously low" levels of some stocks; another proposed "shock and awe" politics in order to get the economy running again. The forceful global deformations introduced by the neoliberal reformulation of self-interested profit maximization became apparent in thisinstant of simultaneous broadcasting of civil unrest and financial war. The live coverage of the uprising in Greece and the fall in prices, each with its accompanying visual and oral rhetoric, unintentionally evoked the stark contrast between the capitalist regime of financialization[6] on the one hand, with its debt-induced grip on politics and the economy, and on the other hand the effects of this regime on the notion of the public good. When the spotlight panned from the destroyed common ground in Greeceto the historic instance of an algorithmic crash, market disequilibrium on a gigantic scale obscured a catastrophic failure of an even vaster extent. The Flash Crash eclipsed what has become the symbol of the ruination of the agora of commonality, epitomized by the eruption of popular protest in the site of its ancient origin in Athens.

Below the radar of agencies that were established to monitor market activity, corporate self-interest had created an even deeper level of incorporation: it was programed into the "genetic" code of a new breed of financial agency, the automated daemons of algorithmic trading.[7] Derivatives of mathemati-cal models, algorithms had already revolutionized the logistic infrastructure of exchanges by displacing the trading pit and thus its market makers (the human traders known as "locals") in favor of faster execution rates. Subsequently, these daemonic powers were let loose to directly negotiate with one another on computerized matching machines, exploiting trading opportunities at a speed inaccessible to their human competitors. The foundations for this radical shift were established in the early 1970s. Donald Mackenzie informs us that "financial economics […] did more than analyze markets; it altered them. It was an 'engine' in a sense not intended by [Milton] Friedman: an active force transforming its environment, not a camera passively recording it."[8] Gil Scott-Heron's 1970 "The Revolution Will Not be Televised" comes to mind, a politically radical poem released at about the same time when the most significant model, the Black-Scholes formula, introduced an algorithm that sparked the first derivative wave of neoliberal market revolutions that today hold sway over the world. But while Mackenzie's account is mainly concerned with "bodies" and their operations, High Frequency Trading (HFT) has in the meantime abandoned human traders for quant-coded algorithmic market making.

As collateral damage, the epitome of territorialized capitalism, Wall Street, had become a mere symbol. While the crowded trading floor of the New York Stock Exchange (NYSE) is still the undisputed televisual icon of the "market," the media presence obfuscates, more than reveals, what the market has actually become, as a result of what I term the *quantitative turn* in finance. Since 2012 the NYSE and its trading floor have been the property of Intercontinental Exchange, a provider of algorithmic trading platforms operating from Atlanta, USA.[9] The new pivotal architectural nodes of what has turned into a deterritorialized, informational capitalism are now

the nondescript and non-representative warehouse buildings, filled to the brim with computer servers and fiber optics, in suburban areas such as Mahwah, New Jersey.[10] Although in 2010 this was still future in the making, something unsettling had dawned on acute observers of the epic failure described as the Flash Crash: algorithmic daemonic powers, put in the driver's seat, had slipped away from human control. For the first time, bots had caused mayhem. Not only were automated trading desks[11] affected, but this "revolution" flashed into view as a globally televised event.

**Forensics without a Forum**

The past is only the impatience of the future.
—— ElieAyache[12]

Despite these potential warning signs, however, acute observation was not widespread. A joint commission of two US regulatory bodies, the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC), undertook an investigation[13] into the transaction matrix of this singular event: its results were widely criticized as unsatisfying.[14] In a nutshell, the report came to the conclusion that human error reinforced by computer trading procedures triggered the Flash Crash. It blamed a single trader of a mutual fund representing long-term investors for causing the meltdown. Meanwhile, a less-cited investigation conducted by a small market data feed analyst, Nanex, produced a more convincing result, which challenged the SEC report.[15] Nanex based its research methodology on what could be called a forensic archeology of historical trading data, and reached a conclusion that, unlike the official report, was not unwittingly[16] streamlined to a financial elite with major vested interests in high frequency trading (or HFT—this is the

generic term for computer-driven algorithmic trading, which takes place in microseconds). As we will see in more depth below, Nanex proved that algorithmic trade execution triggered the event without human interference. The reason the two reports arrived at such divergent results cannot be attributed to a shortage of material to investigate. Rather, we can ascribe the successful approach to two crucial factors. The first is a quality of depth in investigation, or more technically, the production of quantitative camera-engines with higher resolution on the split-second time scale in which high frequency trading is carried out. The strata to be investigated had to be discovered and discerned rather than simply considered and surveyed. Thus, algorithmic analytics devices were crucial for unearthing the archeological evidence[17], Its material elusiveness—which I will attribute below to a new breed of machines that turn apperception from conscious perception (when mental attention is coupled with previous experiences and conceptions) to technological cognition—hides a thick surface of myriads of data characterized by a propensity towards invisibility and a sort of "counter-perception" that easily escapes cognizability. This fact marks the second crucial aspect of the analysis, the act that made it possible in the first place: the disclosure of proprietary trading data. I will refer below to this ambiguous but essential act as a manifestation of the Janus-face of the expert witness in the field of a forensics of algorithmic and automated trading.

The SEC and CFTC based their official report on the material made available by exchanges and market participants, which showed one-minute trading intervals. This dataset would have been adequate to scrutinize trading activities before the ascent of HFT. But today, to quote the founder of Nanex, Eric Hunsader, "in the blink of an eye, the market moves what used to take humans thirty minutes."[18] With

HFT and the Flash Crash—whose naming enunciates a new category of speed—a one-minute resolution view of the material composition conceals more than it reveals. The following account of the Facebook stock market launch (IPO) illustrates the order of magnitude:

Eric Hunsader: [...] NASDAQ was trying to open the IPO up. By their third attempt, they're telling everybody *Wait, we'll get it at 11:05. No, we'll get it at 11:10, no we'll get it at 11:30.* So it was do or die time.[...] Somebody there has the bright idea to just reboot the system. It takes NASDAQ offline a full seventeen seconds. [...] When NASDAQ finally did reappear, what happened? The orders that were resting in the book all that time immediately disappeared. Like 60%-70% of all liquidity within 200 milliseconds is gone [...].

Chris Martenson: So seventeen seconds of going dark for one of the largest exchanges out there. That must have been several lifetimes for these algorithms.

EH: Seventeen million microseconds.

CM: Seventeen million microseconds, that's forever.

EH: It is forever and that's why we see the liquidity and all these books just go—*poof!*[19]

For Hunsader, the order of magnitude of microsecond time scales poses a threat to market activity per se. An instantly precipitated lack of liquidity––the disappearance of automated market orders––is the blueprint for market collapse because "[a] lgorithms prefer predictability. If something spooks them (e.g., unexpected breaking news; a delay in the market's opening), they simply stop trading. [...] With no support and no bids, prices can drop dizzyingly fast. Making matters worse, the 'smarter' algos[financial lingo for algorithms]can recognize a downdraft in process and begin piling back into the market on the short side, exacerbating the price declines."[20]

But what this quotation also illustrates is the sheer pointlessness of scrutinizing market activity at one-minute intervals. The officials charged with throwing light on the background of the Flash Crash therefore examined an image that they mistook for razor-sharp, unaware that it was blurred and useless. Nanex was able to escape the trap by mistrusting the superficial matrix of one-minute trading accounts. Eric Hunsader subsequently commented that the SEC/CFTC analysts clearly "didn't have the dataset to do it in the first place. One-minute snapshot data, you can't tell what happened inside of that minute," also noting that his own analysts "didn't really see the relationship between the trades and the quote rates until we went under a second."[21]

**Reperformative Forensics**

In real-world systems, nothing could be less normal than normality.
—— Andrew Haldane and Benjamin Nelson, Bank of England[22]

Nanex is a market research firm that supplies real-time data feeds of trades and quotes for all US stock, option and futures exchanges. As their website states, "we have archived this data since 2004 and have created and used numerous tools to help us sift through the enormous dataset: approximately 2.5 trillion quotes and trades as of June 2010."[23] Elsewhere they declare that "Nanex's database is now more than 20 times the size of NASA's. That's right—we've got more data on the stocks than we do on space."[24] The capacity to build algorithmic machines that allow the processing of information on such a scale is fundamental to gaining a resolution capable of visualizing—and thus understanding—the trades and quotes that are executed far below the threshold of human sense perception.

Nevertheless, Nanex did not see this data as sufficient to account for the Flash Crash because they could not match it to its respective sources. As the former HFT trader David Lauer remarked: The markets and the interplay in the industry between all theses firms with all these very complicated and complex technology systems and how they interact makes the entire system of exchanges, high-frequency, brokers and the interaction between the technology, it makes it a complex system. [...] There is no cause and effect that you can point to. What caused the Flash Crash is a nonsense question. [...] And, if you were to replay the same sequence of events, identically, there's no guarantee that it will cause a Flash Crash again. That's the nature of complex systems.[25]

The next step, therefore, was to apply a different strategy, or rather to extend the approach. Discontented with the official report, Nanex resorted to an investigation accomplished not only after the fact but also *after the investigation*: they asked the party blamed (though not identified) in the official report, the mutual fund Waddell & Reed, to grant access to their trading data. In line with the capitalist proprietary regime, it is quite plausible that the fund would have declined this request if it had been made before they were blamed. But by the time the Nanex analysts were conducting their investigation, Waddell & Reed would have had a keen and vested interest in clearing their name, such that they were prepared to disclose their trading data from the time of the Flash Crash. Hence, the incorporation of the "source code" of a proprietary dataset allowed Nanex to classify the data and deliver an account of the actual events that happened in micro time.[26] The analysis relies on an apparatus that pairs the following three different custom-made quantitative frameworks in an effort to deliver a sufficient approximation of trading operations: firstly,

Nanex's enormous and ever-extending archive of financial data; secondly, their adaptive quantitative resolution devices that allow investigating these data sets; and finally, the algorithmic trading data of a proprietary participant. This framework allowed them to produce the groundbreaking narrative that subsequently brought to light the cybernetic regime of HFT. Borrowing a linguistic term that is widely used in computing, econometrics, and quantitative finance, we can outline this process as the parsing of the trading performance after the fact (the proprietary dataset provided by Waddell&Reed) by performative cameras that not only analyze but craft a narrative representation (the analysis accomplished by Nanex).

The final representation of the event is composed of an abundance of colorful simulations produced to visualize and flesh out the activities that took place in microseconds. This is a techno-aesthetics that counters the fundamentally iconoclastic situatedness of quantitative informational sign machines which do not communicate with humans. The vision-enhancing sensors that detect the time-blurred traces and help to mark discriminationsin a highly complex environment deliver information that has to be "digested" in a separate stage in order to raise it to the surface of visibility and comprehensible representations. Thus, the forensic analysis is neither fully embodied nor defined by the abstract representations of data traffic. Rather, the methodology directing the analysis is situated, i.e. constructed, in-between the juncture of performance as the actual presence of an event taking place (exemplified by the occurrence of the Flash Crash) and representation as providing "visual collateral" of a performative re-animation of the original obscured presence after the fact. From this, we can now outline a sharper distinction which will help us to grasp what is at play in the documentation and evaluation apparatus.

Artificial sense organs reach into deep time by increasing the resolution bandwidth in order to revisit the otherwise insensible "scene of the crime." The forensic analysis is thus an intricate and extensive cybernetic undertaking characterized by a process of re-mapping, re-modeling, re-visioning, and re-narrating a specific past that happened at near-light speed—a performance *ex post* that *was* the occurrence of a future event. As this approach re-enacts the *performance* of the event, the methodology can be specified as *reperformance*. The technological, calculative aspect of sifting data to come up with evidence—enacting the reperformance—becomes explicit in the sheer enormity of the material Nanex examined:

May 6th had approximately 7.6 billion [...] records. We generated over 4,500 datasets and over 1,200 charts before uncovering what we believe precipitated the swift 600 point drop beginning at 14:42:46 and ending at 14:47:02. In generating these data sets we have also developed several proprietary applications that identify the conditions described in real time or for historical analysis.[27]

While the ground layers of the disaster zone that led to the blaming of the usual culprit—a human agent—showed nothing but detritus, only rigorous research into the deeper, less perceptible strata of microscopic time revealed the actual material matrix. What emerges is an excavation that evaluates an inversion of the relation between time and space: while the common notion of archeology entails entering into concrete and thick space cautiously (as when employing technologies of surveying, probing, and classifying, for instance), in order to extract the material witness of a former era, a forensic archeology of finance, in contrast, probes into the imperceptible materiality of time to detect patterns and recover artifacts whose existence is derived from financial models and built on technologies of miniaturization,

automation and infrastructure aligned with politics of securing, excluding, and enclosing. The story of the Flash Crash unfolds in the immensely extended realm of trading bandwidth in which what becomes apparent is a technopolitical regime of exclusion/inclusion that clearly prioritizesthe algorithmic "aesthetic and mode of thought"[28] of a tiny but superior elite of HFT traders, or, more precisely, HFT quants. In the attempt to illustrate the complex background of the impact, Nanex resorted to metaphor: "The SEC report uses an analogy of a game of hot-potato. We think it was more like a game of dodgeball among first-graders, with a few eighth-graders mixed in. When the eighth-graders got the ball, everyone cleared the deck out of panic and fear."[29]

**The Liquidation of Liquidity**

Shit happens, don't judge me.
—— SuhailMalik[30]

With this in mind, it is not surprising that sociologists of finance, such as the London School of Economics' Daniel Beunza, speak of the Flash Crash as a watershed event in the history of markets. The official narrative has up to the present day not seen fit to abandon the usual scapegoat of the human actor, presumably due to a reluctance to lay the blame upon technologies and infrastructures that have seen massive investment in recent years, including high-end quantitative engineering, fiber optic networks and data collocation systems, as well as the security infrastructure (the global real-time network architecture of financial markets).[31] Yet the actual analysis of the Flash Crash produces a picture saturated with a violence whose perpetrators evidentially were neither human agents nor human-robot interactions (as the SEC report concluded) but massive robot-robot interactions materialized

in trading quotes. In the era of algorithmic trading, distinguishing between quotes (bids or offers) and actual trades (when a bid and an offer are matched and deliver a price) is crucial because in comparison to quotes only a smaller amount of market action delivers trades. Nanex provides estimates that tell the story in full: more than 70 per cent of exchange trades are due to algorithms;but exchange quotes surpass this figure to a degree that lends the term capitulation a new meaning—99.9 per cent.[32] These figures prove that a bot almost always partners a transaction.

Hence, algorithmic trading adds to market liquidity,[33] as advocates of HFT never get tired of emphasizing.[34] The irony, though, is that they are more than right on this point—in actual fact, algorithmic trading is the liquidity of the market. The obvious conclusion is that trading machines have taken over. High-level investment strategies are shifting from human decision-making to machine decision-making. Wilkins and Dragos argue that "[a]lgorithms are no longer tools, but they are active in analysing economic data, translating it into relevant information and producing trading orders."[35] With algorithms calculating probability and deciding on entry and exit strategies as well as execution, an event (for instance bad news about the economy or political incidents, etc.) might easily stop their action and massively drain the market of liquidity, as the incident of Facebook's IPO illustrates.[36] Which human market-maker on one of the few remaining trading floors would dare to take competitive issue with bots acting in microseconds in the knowledge that "shit happens"––that bot quotes disappear in a flash or a bot strategy triggers a huge amount of other bots that reinforce the event? As a result of speed, the market forum is deserted in a flash (by human standards) when a Flash Crash (by algorithmic standards) is born.

The evidence procured by Nanex's exacting application of forensic data gathering and analyses to a degree seldom experienced in the context of financial markets reveals that trading technologies and procedures today shape markets beyond both the intellectual and political grasp of officially installed regulatory bodies.[37] These facts point to a space of (trans)action which not only surpasses human trading and regulatory surveillance capabilities: the incompetence of governance—technologically as well as intellectually—also has obvious effects on the political leverage of policymakers and, in turn, of constituents. This is exacerbated by the fact that we are dealing with a field in which the eyewitness is invalidated because these processes are beyond the cognitive ability of the human brain.[38] No-one is present at the scene, no-one observes what is happening. As one commentator put it, quoting the trader and author Sal Arnuk: "It's not just that humans are less and less involved in trading; it's that they can't be involved. 'By the time the ordinary investor sees a quote, it's like looking at a star that burned out 50,000 years ago.'"[39]

From an imaginary perspective of algorithms (or algos), humans live in a backward corner of the galaxy. From a human perspective, algos are out of direct reach and the remote control unit has been lost in the bedlam of deregulation, political stalemate, and the "irrational exuberance" of economic boom times.[40] These shortcomings are not only detrimental in an economic sense. They stifle the potential for delivering judgment through the processes of political dissent, debate, and control (for recovering remote control, as it were), as they already relegate informed political and legal action to the level of non-transparency with regard to business procedures. The "liquidity" essential for policymaking—the availability of all information required for informed decision-making—is liquidated as well. The public forum introduced to deliver evidence af-

ter the fact has capitulated while forensic analysis capable of establishing collected evidence has seldom been heard.

**Algorithmic Apperception**

All consciousness is a matter of threshold.
— Gilles Deleuze[41]

The distinct narratives that were constructed around the Flash Crash and its investigations illustrate to what extent a forensics of financial markets already encounters difficulties in the phase of collecting evidentiary statements. Obtaining such data from the black boxes of proprietary trading firms is notoriously hard.[42] Moreover, investigations are seldom brought before a legal forum, as they already meet insurmountable obstacles at the level of networked governance. A detailed examination of this case—an endeavor that would go beyond the constraints of this article—would show that this is not simply a technical question but is rooted in the interests of incorporated stakeholders.[43] Adopting the viewpoint of ecological economics, Wilkins and Dragos address this issue the following way: At the bottom there are the basal species—slaves, serfs, proletarians, free labor, consumers, account holders, etc. These strata are preyed on by those further up the food chain—pension funds, insurance companies, mutual funds, retail banks; and they in turn feed larger financial institutions, such as hedge funds, brokers, investment banks, propriety trading HFTs, etc. Each financial actor exploits the inefficiencies of the prey species and in the process produces new inefficiencies, further increasing the information gradient. Within this complex ecology there is a gradual stabilisation of predator-prey relationships, but unlike an actual ecosystem, the financial system has a much higher rate of change, leading to more abrupt singular events like flash-crashes evolving according to an accelerated rate of punctuated equilibria, with multiple black swans and mass extinctions.[44]

Algorithmic bots quote in microseconds. But a quote is just an offer to buy or sell, not a transaction. On the one hand, as mentioned above, quoting provides liquidity for transactions to happen (there is "always" a quote that matches your order and thus renders a transaction and a price). On the other hand, enormous amounts of quotes flood the matching machines of exchange places. Quotes are often placed without the intention to execute. In such instances, their objective is not to facilitate transaction, i.e. to trade; rather, as hidden searchlights in the "dark time" beyond human perception, they prey, for instance, on inefficiencies in the way-slarge block orders are executed by institutional investors that are rebalancing their huge portfolios.[45] There is little doubt that such aggressive conduct would be considered a crime if we were to translate it to human behavior. But the latest breed of financial daemons seem to be accorded special allowances in this regard, as Jerry Adler has suggested:
Many [quotes] were never meant to be executed; they are there to test the market, to confuse or subvert competing algorithms, or to slow trading in a stock by clogging the system—a practice known as quote stuffing. It may even be a different stock, but one whose trades are handled on the same server. On the Internet, this is called a denial-of-service attack, and it's a crime. Among quants, it's considered at most bad manners.[46]
Doyne Farmer, co-director of the program on complexity economics at Oxford's Institute for New Economic Thinking, notes that "under price-time priority auction there is a huge advantage to speed."[47] As perception and decision must also be in touch under micro-time conditions, in order to avoid acting purely at random(or rather to implement the random

indeterminacy of contingencies), quants (financial lingo for the quantitative analysts that develop algorithms) have consequently been programming decision-making into financial algorithms. Farmer's statement therefore leaves room for an interpretation that points to an incentive to implement hurdles for competitors and other insiders (such as regulators) alike. Keeping them in the dark about algorithmic processes not only results in unfair competitive advantage, but ultimately leads to a technological politics of segregation that amounts to the survival of the fittest quant.[48] Felix Salmon, a financial blogger for Reuters comments: "inevitably, at some point in the future, significant losses will end up being borne by investors with no direct connection to the HFT world, which is so complex that its potential systemic repercussions are literally unknowable."[49] It is safe to say, therefore, that such a development extends the predator-prey logic of capitalist market competition to a new order of magnitude, which incidentally makes a mockery of the judiciary.

The crucial question is not that of the (in)equality of investment opportunities—to which the predator-prey metaphor would provide an answer. The more radical effects are "borne" by decision-making processes: we cannot make a decision on something that we do not perceive. Recognition in at least one of its many manifestations—be they visual, textual, technological, algorithmic or other—is conditional for apperception and decision-making. Michel Serres' concept of the parasite/host seems more apt to delineate the new capitalist hegemony that becomes apparent in the interleaving of the black box of time fractions and the black box of proprietary technology, in which even the ideology of the "free market" is reduced to utter absurdity, with proprietary artificial sensing organs capable of penetrating into the dark kept undisclosed by their owners as if their possession were an inalienable right. Given the sheer influ-

ence of capitalist markets on society and the power of decision-making exercised by financial over public interests—a situation we have been witnessing over and over again in recent years—this not only applies to those individual investors that bots feed off directly (Salmon's concern) but also to the trillions of people who are "invested" as resources in a parasitic system that is at the same time the host.

**A Parasite Host**

This is truly the brave new world we are trying to regulate.
—— Commodity Futures Trading Commission (CFTC) Commissioner Scott O'Malia [50]

The cross-fade on CNBC that slowly followed the turn of attention from the live footage of the Greek insurrection to the uncanny intrusion of increasingly volatile market data is not simply a random coincidence of events or an unfortunate accident. Rather, the Flash Crash constitutes the proof of concept of the power of quantitative decision-making circuits. HFT has not suffered in the aftermath of the collapse. Quite to the contrary, it gained a competitive advantage over other market participants. Furthermore, it became evident that it is obscure to those commissioned to regulate these practices. In other words, the regulators are not in a superior position .To the contrary, the decisive superiority of HFT corporations over political supervisory bodies was effectively confirmed by SEC representatives when they conceded that the task of building and installing a data feed from scratch, which would allow them to monitor market activity, proved too complex. Thus the SEC had to resort to subscribing to the homegrown data collection system of an HFT company. "The wide gulf in technical prowess between the regulators and the regulated became

painfully clear that year [of the Flash Crash], prompting the SEC to explore hiring an outside firm that could gather up-to-the-minute market feeds from the public exchanges."[51] Although this policy move was welcomed, the deal highlights a paradoxical politics that follows the logic of the lesser evil: the data provider commissioned by the SEC, Tradeworx, is one of the foremost HFT trading firms.[52] Their CEO, Manoj Narang, is one of the industry's most outspoken champions of data-driven decision-making.[53]

The game that is visually represented by changing numbers on TV screens all over the worldtoday has in fact become invisible and beyond the knowledge even of insiders, as parasitic circuits use technology to conceal their profit opportunities. As Eric Hunsader remarks, "we allow people with faster connections to place and remove offers or bids faster than the speed of light can deliver that information to the other market participants."[54] Thus such practices derail the backbone of capitalist market logic, the allocation of resources based on supply and demand; in an ironic turn, Adam Smith's "invisible hand" makes new sense. In the aftermath of the technology-based quantitative turn in finance, access to a data stream service alone is not the solution to reaching and staying on the same level as corporate HFT units. Technological development leaps forward and so does knowledge production. In this field of technopolitics, critics lament, regulators lag far behind even though steps have been taken to come up to par. In 2010, the SEC, which until then had mainly employed lawyers, started to hire more technically-oriented staff. But as one newly drafted specialist, economist Rick Bookmaster, concedes in a *Washington Post* article, the stakes are high and the gamble could well be lost due to the disadvantages of competition:

This job cannot be done by SEC lawyers or career government workers. [...] We need to entice market professionals into government service who are on par with those in industry. [...] The challenge [...]is in recruiting undergraduate computer science wizards who might otherwise [...] trade for hedge funds. We have to rely on public spiritedness as opposed to dollars to pull them here.[55]

This attests to the degree of perversity inherent in the financial system. Having first been lured away with big salaries from the less affluent fields of science and production, engineers, mathematicians and physicists are subsequently subject to attempts to persuade them to help take action against the new hegemony. This attests to the overexposure of markets in society: a more twisted, if not false, version of public spiritedness would be hard to find. Although this boils down to drafting in renegades willing to "sacrifice" for a greater good, financial capitalism per se is not challenged.Such a "greater good" seems a far cry from, for example, the common good that would be effected by dissolving the debt bonds set up by markets and financialization.

Hence, the complex, self-generating, self-replicating, self-referential registers of algorithms are part of a larger medium of information circulation. Geared towards exploiting miniscule inefficiencies (in financial terms, arbitrage), what has been termed an arms race to zero (the competitive battle to achieve the technological means of trading at speeds approaching the speed of light) is directed towards deeper levels of exploitation that connect these low latency (i.e. extremely rapid delay processing) machines to the slower computer networks of the financial infrastructure, and from there to wider social nets. In terms of the logistics inherent in HFT, distribution is paramount. Automation not only produces material items (bids and offers, in our example) but also manipulates the conditions of delivery by distorting the "field homogeneity" of the financial matching network. In other words, equal access to the matching

machines of exchange places tends to be squashed where HFT rules. Automated spreading of quotes, for example, is not about benefitting from market liquidity by the generic matching process of supply and demand (bids and offers), which is reflected in prices. Rather, these schemes *make* the address by attracting and decoying technologically less privileged order frames and thus construct prices by distorting supply and demand. As producers of noise (the myriads of quotes that serve as liquidity traps), these parasites are only the first in a line, feeding off a host that is in turn a parasite exploiting arbitrage opportunities, and so on. "In the parasitic chain, the last to come tries to supplant his predecessor."[56]

Battled out between corporate vested interests that can afford the escalating expenses, the transactions delivered by the infrastructure of trading engines create the impression of a virtual if not immaterial battlefield subject to only minor material restraints. Nevertheless, the pivotal factor in leveraging this speed war is geographical location. As mentioned before, the less space between the proprietary trading and the exchange's matching engines, the faster the process and consequently the bigger the competitive advantage for whoever is thus optimizing the logistics of HFT automation.

Speed is of the essence. This is why with HFT the "information gradient" discussed by Wilkins and Dragos above is basically a speed gradient. "A trend that began with pigeons ends with subatomic particles, carrying data that is outdated almost before it arrives at its destination."[57] Even if there is an absolute limit to these developments, a divide has opened up, a gaping but invisible abyss: by exploiting timescales beyond the threshold of perception a new class of enclosures has found the means effectively to hide its machinations from slower competitors and public influence alike. In this field, Gottfried Wilhelm Leibniz's notion of apperception has ceased to

be a conception of conscious experience emerging from small, unconscious perceptions. The myriads of mathematically constructed small perceptions (of which these camera-engines are not at all "unconscious") define a virtual field of machine apperception where those who do not command the latest cyborg infrastructure are captured or blocked. The financial market architecture with its proprietary algorithmic logistics has become a black box not only with regard to the parameters of official inquests, but also in terms of knowability much more generally. Thus, what the black box emits is not information but noise. This *technowledge* (to craft a term for the fusion of technology and knowledge beyond human apperception) exerts influence not only on much of the industry but of necessity cripples the public forum as a whole. We encounter a global system that acts not only in the dark but "in the dark of time." While the past is a random figure, a deficient but nonetheless highly valued stochastic reservoir of historic data calibrated to model future probabilities, the future has turned into a becoming that eclipses the very notion of the moment. In the horizon of human experience, a violence has taken hold that is unnamable, as the flashes of its *now* have no opening. It only strikes collateral. When *that* instant leaks into a moment (the same moment yet a fraction after the micro-instant) and noisestarts inflating into a bubble, the abyss of the market crash opens to a bottomless pit of "capitulation" on all fronts.[58] Suddenly, the helpless idiom expressed on CNBC Live reveals its pathological purport: It manifests an assault on a defenseless public—capitulation is nothing else than the cry for bailout. The parasite takes host-age, blackmailing with debt. Thus, the true derivative—that which is dependent on and at the same time fundamental for risk markets—is not a tradable risk product but the public as last resort. We are the ultimate hedge.

## The Future Forum and the Double Figure of the Expert Witness

Those who exercise power always arrange matters so as to give their tyranny the appearance of justice.
— La Fontaine[59]

If it weren't for the sheer mathematical abstraction, iconoclast "imagery" and legal non-disclosure arrangements that occlude these closed microsecond sessions from almost any investigation,[60] let alone inquest, the violence exerted and the pains suffered would arguably not so easily slip under the cover of the hegemonic ideology of the free market as social institution. In the war over miniscule trajectories of future events (risk potentials) and inadequacies happening in moments that can only be noticed by bots (arbitrage opportunities), all those who are not invested in the latest breed of cyborg engines lack apperception and speech—and thus the means for conscious and experienced perception and expression. Furthermore, as we have learnt, microsecond manifestations escape inquest and litigation. One could make the case that a violence that violates below the threshold of political forums (including that of jurisdiction) undermines the economic as well as political frameworks set up to keep regimes of power in check. Bot coding is about a relational apperception constituted in an idiom of risk sensitivity, measure, and production that is not constructed to communicate with humans directly.

The artificial life world of financial automation, unsurprisingly perhaps, is not about freedom and equality. It is about a struggle for competitive advantage, if not monopoly, battled out on a surface on which humans cannot tread. The live audio recording of the Flash Crash from one of the few remaining trading floors where human traders still serve as market makers delivers striking proof of the intermittent uninhabitability of the trading environment.[61] It also resonates with the Nanex quotation cited above: "When the eighth-graders got the ball, everyone cleared the deck out of panic and fear." Despite the near-elimination of the eyewitness from the scene (who as market maker is an expert witness at the same time), the paradigmatic shift to electronic exchange (in most markets) gives rise to the cognate notion of a subtly different kind of witness, one who would be capable of challenging this calculative rape: the *traitor,* the *informant*, the *renegade* who transgresses the unwritten laws of complicity and secrecy. By providing material from undisclosed or classified sources on a broad range of subjects this figure of the whistleblower has in recent years turned the principal witness for the public, procuring otherwise unavailable evidence of violence. In the financial context, this particular manifestation of the witness—who does not testify on the basis of real presence—becomes the medium of forensics by a logistics of redirection (e.g. the leaking of confidential material that cannot—must not—speak for itself). This witness is not a plain informant. The financial renegade who presents objects as subjects-of-debate is an expert witness as much as the scientific analyst ally who subsequently (re)constructs the forensic narrative by composing the facts. The story of the Flash Crash offers an example of paradigmatic and at the same time ambiguous significance for the possible production of future forums, depicting in all its complexity the horizon of an exposed and discontinuous self-regulating force against the boundless utopia of a self-regulating market.

This Janus-faced configuration of the doubled expert witness might indeed be a figure that resonates with the complex situations encountered by forensics, in which "only the criminal can solve the crime."[62] The notion of the expert witness as one

who was originally involved in the event under investigation seems to highlight the Achilles' heel of the particular mode of calculative oppression that works through HFT as part of the paradigm of the neoliberal market. The intricate problem of the resolution of the Flash Crash demonstrates the ambiguity contained: the participation of an insider or even (alleged) perpetrator is required in order to unearth evidential data that was buried in fractions of a second. This is reflected in the SEC's strategy of employing figures with first-hand experience of and expertise in the activities they want to uncover:

Michael Fioribello, 38, might know more about derivatives than anyone else at the agency. Before going to the SEC, he worked at AIG for nearly a decade, helping to manage the company's derivatives operation [...]. [He] has provided colleagues with insights into how financial players structure derivatives to conceal something that could be illegal. "[...] There can be bells and whistles done to reduce transparency or otherwise circumvent federal securities laws."[63]

In addition to hiring renegades, a further ambiguous but vital objective is to accelerate technological advancement in order to come up to par with perpetually evolving industry standards.[64] In contrast to espionage or surveillance, exploring and surveying an as-yet-unknown environment bears a similarity to cybernetic *reconnaissance*. The military analogy reveals a problematic approach in the regulatory body's perpetual chasing after a glimpse behind an ever-moving frontline, as the afore-mentioned subscription to the data feed of HFT's leading proponent Tradeworx by the SEC illustrates.

Finally, another ambiguity suggests itself: the *only wayout* for policymakers, lawyers, activists, and the public in general—the only route forward to the public forum and away from the dominance of boundless and unregulated (i.e. self-regulating) markets—entails, at least for the time being, actively encouraging and supporting the disclosure of proprietary financial data to the public—a criminal offense, except where the source is the owner. Only *renegade solidarity* aimed against the pathological deformation of cognoscibility in this vital field of contemporary power relations seems capable of delivering the relevant information that is fundamental, to paraphrase the quotation from Leibniz which opened this paper, for apperceiving the "mighty roar" of financial markets. In all its ambiguity, reperformative forensic analysis, performed by the double figure of the cyborg expert witness, is a productive force in facilitating a body of accurate performative translations that incorporate the nucleus of the future forum. Instead of resorting to simple answers (the human factor) it enters directly into complex power relations.

In concert with a specific public (in neoliberal lingo, stakeholders), this insurrection against an increasing hegemony of algorithmic daemon powers may facilitate leverage (as ample proof alone is apparently not sufficient) to resurrect both the legal forum of corporate litigation and the political forum of legislation. *Renegade solidarity*, however,exceeds the finance-state complex. It invigoratesthe fundamental principles of democracybydirectly addressing the public for the common weal.[65] The future forum becomes apparent in manifestationsand revolts that counteractthe neoliberal zealtoredirect the bottomless volatilities of crises from shareholders to society by absorbingthe public into competing stakeholder groups.Thus, the future forum in excess of calculation exceeds demand for justice.[66] It willact to dismantle parasitic proprietary enclosures, foster decision-making on and in a resurrected agora of communality and give voice to those whose inalienable rights are truly exploited.

Notes

1. Gottfried Wilhelm Leibniz, correspondence with Arnould, October 9, 1687, in *Philosophical Writings,* trans. M. Morris (London: J.M. Dent & Sons, 1934), 85.

2. Eric Hunsader, "Coexisting without Colocating," *HFT Review* (Hunsader's blog), October 18, 2011, http://www.hftreview.com/pg/blog/erichunsader/read/12033/coexisting-without-colocating.

3. *The Wall Street Journal* published a more detailed summary one day after the slump on May 7, 2010. See Lauricella and McKay, "Dow Takes a Harrowing 1,014.14-Point Trip," *The Wall Street Journal,* May 7, 2010.

4. Gary Dorsch, "The Forgotten 'Flash Crash'––One-year later," *Global Money Trends newsletter,* May 2, 2011, http://www.sirchartsalot.com/article.php?id=152.

5. See "FLASH CRASH May 6, 2010 CNBC," http://www.youtube.com/watch?annotation_id=annotation_191025&feature=iv&src_vid=7UhKOs3dYk4&v=lJae0zw0iyU, accessed September 2013.

6. Wikipedia summarizes "financialization" succinctly as "a term that describes an economic system or process that attempts to reduce all value that is exchanged (whether tangible, intangible, future or present promises, etc.) either into a financial instrument or a derivative of a financial instrument." http://en.wikipedia.org/wiki/Financialization, accessed September 2013.

7. The website of the Linux-based operating system Arch has a short and comprehensive definition: "A daemon is a program that runs as a 'background' process (without a terminal or user interface), commonly waiting for events to occur and offering services. A good example is a web server that waits for a request to deliver a page [...]. While these are full featured applications, there are daemons whose work is not that visible." https://wiki.archlinux.org/index.php/Daemons, accessed September 2013.

8. ] Donald Mackenzie, *An Engine, Not a Camera* (Cambridge: MIT Press, 2006), 12.

9. Javier E. David, "ICE to Buy NYSE for $8.2 Billion, Ending Era of Independence," CNBC, December 20, 2012, http://www.cnbc.com/id/100330589.

10. "The data center of NYSE Euronext, the international conglomerate that includes the New York Stock Exchange, is in a building in suburban Mahwah, New Jersey, 27 miles from Wall Street." Jerry Adler, "Raging Bulls: How Wall Street Got Addicted to Light-Speed Trading," *Wired*, August 3, 2012.

11. Coincidentally, Automated Trading Desk LLC pioneered automated HFT in the wake of the 1987 market crash. They state on their webpage: "Welcome to the future of automated trading. [...] A world where only those that can move fast enough to predict market shifts are able to compete at the highest level." http://www.atdesk.com, last accessed October 2013.

12. ElieAyache, *The Blank Swan: The End of Probability* (Chichester: Wiley, 2010), 421.

13. "Findings regarding the market events of May 6, 2010." Reports of the staffs of the CFTC and SEC to the joint advisory committee on emerging regulatory issues, September 30, 2010, http://www.sec.gov/news/studies/2010/marketevents-report.pdf.

14. For two examples of criticism concerning the report's findings, see Tyler Durden (alias), "SEC Releases Final Flash Crash Report—Waddell And Reed Blamed As Selling Catalyst," *ZeroHedge*, October 1, 2010, http://www.zerohedge.com/article/sec-releases-final-flash-crash-report-waddell-and-reed-blamed-selling-catalyst; and for harsh criticism even before the official presentation of the report, Christopher Steiner, "Searching For Flash Crash Culprit, The SEC Fingers Wrong Man," *Forbes*, September 9, 2010, http://www.forbes.com/sites/christophersteiner/2010/09/09/searching-for-flash-crash-culprit-the-sec-fingers-wrong-man.

15. Nanex' final statement, titled "Flash Crash Mystery Solved," March 26, 2013, can be found with links to its research at http://www.nanex.net/aqck2/4150.html, last accessed September 2013.

16. A statement by Nanex, however, points to a different conclusion: "The email exchange [ with one of the co-authors of the official report ] was very disturbing because the explanation was basically a new and bizarre definition of liquidity [...] [that] states that if a High Frequency Trader (HFT) aggressively buys contracts by executing against existing orders posted by a seller, then the HFT could be classified as a liquidity provider, and the seller classified as a liquidity taker. [...] it is exactly opposite of the industry accepted understanding of liquidity, not to mention, basic common sense. It's like saying *up* is down and *down* is up. It seems they were trying to fit the data to match a foregone conclusion. [...] To base any future regulations on either of these papers would be ill-advised and reckless. Someone needs to do some serious house cleaning at the SEC and CFTC." "The SEX Redefines Liquidity (when it's convenient)," Nanex Research, April 12, 2012, http://www.nanex.net/aqck/2977.html.

17. "Analysis of the 'Flash Crash'," Nanex, June 18, 2010 (since updated), http://www.nanex.net/20100506/FlashCrashAnalysis_Intro.html.

18. Transcript of Adam Taggart, "Eric Hunsader: Investors Need to Realize the Machines Have Taken Over. The Blink of an eye is a lifetime for HFT algos," *Peak Prosperity,* October 6, 2012, http://www.peakprosperity.com/podcast/79804/nanex-investors-realize-machines-taken-over.

19. Ibid.

20. Ibid.

21. ]"U.S. 'flash crash' report ignores research – Nanex," Sify Finance, October 5, 2010, http://www.sify.com/finance/u-s-flash-crash-report-ignores-research-nanex-news-insurance-kkfiEjeciij.html.

22. Andrew G. Haldane and Benjamin Nelson, "Tails of the unexpected," paper presented at "The Credit Crisis Five Years On: Unpacking the Crisis," conference held at the University of Edinburgh Business School, June 8–9, 2012, http://www.bankofengland.co.uk/publications/Documents/speeches/2012/speech582.pdf, at 20.

23. "Analysis of the 'Flash Crash'."

24. Mills, "Fast Cash Dash Flash Crash Clash: Hear and See Some Super Trading," Radiolab, February 6, 2013, http://www.radiolab.org/story/267356-fast-cash-flash-crash-mad-dash-clash/.

25. David Lauer in MarijkeMeerman, dir., "The Wall Street Code," documentary, 51 min, http://www.youtube.com/watch?v=kFQJNeQDDHA, at 46:00–46:48, accessed November 2013.

26. See, for example, "May 6th 2010 Flash Crash Analysis: Continuing Developments Sell Algo Trades," Nanex, October 8, 2010 (since updated), http://www.nanex.net/FlashCrashFinal/FlashCrashAnalysis_WR_Update.html.

27. See the "About" page on Nanex's website, June 18, 2010, http://www.nanex.net/20100506/FlashCrashAnalysis_About.html.

28. Luciana Parisi, *Contagious Architecture: Computation, Aesthetics, and Space* (Cambridge: MIT Press, 2013), x. Parisi traces the "logic of *computation* and its ingression into culture" (ix) in architectural and interaction design. Although she does not respond directly to finance, her characterization of digital algorithms is also applicable to financial algorithms, insofar as she describes them as "performing entities: actualities that select, evaluate, transform, and produce data" (ix) which "are not simply representations of data, but are occasions of experience insofar as they prehend information in their own way" (xii–xiii).

29. "May 6th 2010 Flash Crash Analysis: Final Conclusion," Nanex, October 14, 2010, http://www.nanex.net/FlashCrashFinal/FlashCrashAnalysis_Theory.html.

30. This quip was intended to illustrate the state of contemporary art. Suhail Malik, lecture given at the California Institute of the Arts (CalArts), April 2, 2013, http://vimeo.com/71058588 (36:33-36:36). The relationship between contemporary art and finance, and their underlying dependence on indeterminacy rather than uncertainty, are addressed in a forthcoming text by the author.

31. For accounts of the background of the Flash Crash and algorithmic trading respectively, see Marije Meerman, dir., *Money & Speed: Inside the Black Box* (Netherlands, 2013), 49 mins., http://www.youtube.com/watch?v=H4BzsevJthw; and *The Wall Street Code* (Netherlands, 2013), 50 mins., http://www.youtube.com/watch?v=kFQJNeQDDHA, both last accessed November 2013.

32. "The Rise and Fall of the HFT Machines," Nanex Research, http://www.nanex.net/aqck/2804.HTML, accessed September 2013.

33. Liquidity is essential for price discovery. It constitutes trading opportunity at an asked price (with minor variance) because of the availability of a buyer or seller respectively. Thus, it implies a constant exchange of information and trades. Loss of liquidity implies unacceptable prices that could ultimately lead to a crash.

34. See, for example, this *MIT Technology Review* feature story on the quant entrepreneur Manoj Narang: Bryant Urstadt, "Trading Shares in Milliseconds," MIT Technology Review, December 21, 2009, http://www.technologyreview.com/featuredstory/416805/trading-shares-in-milliseconds.

35. Inigo Wikins and Bogdan Dragos, "Destructive Destruction? An Ecological Study of High Frequency Trading," *Mute,* January 22, 2013, http://www.metamute.org/editorial/articles/destructive-destruction-ecological-study-high-frequency-trading#.

36. Tyler Durden, "Nanex: Investors Need to Realize the Machines have Taken Over," October 6, 2012, *Zero Hedge*, http://www.zerohedge.com/news/2012-10-06/guest-post-nanex-investors-need-realize-machines-have-taken-over.

37. See more in "U.S. 'flash crash' report ignores research."

38. See Parisi, *Contagious Architecture*.

39. Adler, "Raging Bulls."

40. The expression "irrational exuberance" was used by the former Federal Reserve Board Chairman Alan Greenspan to describe the Dot Com boom and its possibly detrimental results. "Remarks by Chairman Alan Greenspan," Annual Dinner and Francis Boyer Lecture of The American Enterprise Institute for Public Policy Research, Washington, D.C., December 5, 1996, http://www.federalreserve.gov/boarddocs/speeches/1996/19961205.htm, last accessed September 2013.

41. Gilles Deleuze, *The Fold: Leibniz and the Baroque*, trans. Tom Conley (Minneapolis: University of Minnesota Press, 1993), 64.

42. This problem is often the basis of complaints voiced by sociologists of finance like Donald Mackenzie and others. See also note 60

43. As regards the Flash Crash, Nanex's final statement on the case ends with the following remark: "The HFT lobby will vehemently deny any blame for causing the flash crash and will use a number of straw man arguments, eventually enlisting the SEC final flash crash report which named Waddell & Reed as the cause (W&R). [...] This is a very complex subject and lobbyists will use that to bamboozle you." Nanex, "Flash Crash Mystery Solved."

44. Wilkins and Dragos, "Destructive Destruction?"

45. Trading ahead of index fund rebalancing exploits algorithmic program trading by institutional investors who split big orders into smaller trades in order to manage risk. Thus, algo traders parasitically prey upon investors' returns. For detailed descriptions of the diverse strategies used by algo traders, see Scott Pattersen, *Dark Pools* (New York: Crown Business, 2012).

46. Adler, "Raging Bulls."

47. J. Doyne Farmer, "The impact of computer based training on systemic risk," 11. Paper presented at the London School of Economics, January 11, 2013, http://www.lse.ac.uk/fmg/events/conferences/Systemic-Risk-Centre/Foresight-Report_110113/Papers-and-slides/Doyne-Farmer.pdf.

48. As mentioned above, financial regulation is to a great extent conducted by the industry itself.

49. See Will Knight, "Watch High-Speed Trading Bots Go Berserk," August 7, 2012, http://www.technologyreview.com/view/428756/watch-high-speed-trading-bots-go-berserk.

50. Scott O'Malia, quoted in Kambiz Foroohar, "Trading Pennies Into $7 Billion Drives High-Frequency's Cowboys," Bloomberg, October 6, 2010, http://www.bloomberg.com/news/2010-10-06/trading-pennies-into-7-billion-profit-drives-high-frequency-s-new-cowboys.html.

51. Dina El Boghdady, "SEC going high-tech with real-time trade data," *The Washington Post,* Dec. 24, 2012.

52. See http://www.tradeworx.com/.

53. See Urstadt, "Trading Shares in Milliseconds."

54. Laurence Knight, "A dark magic: The rise of the robot traders," BBC News, July 8, 2013, http://www.bbc.co.uk/news/business-23095938.

55. Zachary A. Goldfarb, "SEC is hiring more experts to assess complex financial systems," *The Washington Post,* June 15, 2010.

56. Michel Serres, *The Parasite* (Minneapolis: University of Minnesota Press, 2007), 4.

57. Adler, "Raging Bulls."

58. Noise——as the opposite of information——was first elucidated as a theory of pricing by Fischer Black in "Noise," paper given at the Forty-Fourth Annual Meeting of the America Finance Association, New York, December 20–30, 1985, published in *Journal of Finance*, vol. 41, issue 3 (July 1986): 529–543.

59. La Fontaine (1668).

60. Andrew Lo, the Director of the Laboratory for Financial Engineering at the MIT Sloan School of Management, addressed this problem at a Conference on Systemic Risk and Data Issues in 2011, referring to a study he conducted on a "quant meltdown" in 2007: "we felt a bit odd about this because […] you know for a fact that there are people out there that know what actually happened but they're not talking. So in fact, this entire paper could be science fiction or it could be dead on, we have no idea. To this day we don't know because nobody is talking. They are not allowed to talk because that would disadvantage their shareholders." Video available at http://www.youtube.com/watch?v=nuDIoBeNwD0 (see 13:20-13:55), accessed September 2013.

61. In the thick of the hostile moments of the Flash Crash, Ben Lichtenstein, the "voice of the CME S&P futures pit" exclaimed (to take a single example): "This will blow people out in a big way like you won't believe," Traders Audio, "May 6 2010 Stock Market Crash," May 12, 2010, http://www.youtube.com/watch?v=1mC4tu1NhUA.

62. This is the subtitle of the chapter on Forensic Architecture in Eyal Weizman, *The Least of All Possible Evils: Humanitarian Violence from Arendt to Gaza* (London: Verso, 2012).

63. Goldfarb, "SEC is hiring more experts."

64. Ibid.

65. Its precarious and vulnerable state in informational capitalism might to some extent be conditioned by insufficient coalitions against the global investor/shareholder hegemony—a crucial counterbalance in order to curtail power regimes, which, for instance,trade unionsexerted in industrial capitalism.

66. In the light of automated algorithmic practices in which the future is exploited by the generation of microsecond arbitrage opportunities, the future forum will be a counter-future forum where agency is recuperated from the capitalist enclosure of a future-at-present—among many other things by making use of (instead of being used by) algorithmic processes.