The Humanities and Innovation

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Collaborative Innovation Networks

How to be interdisciplinary

a matter of *design*

innovation?

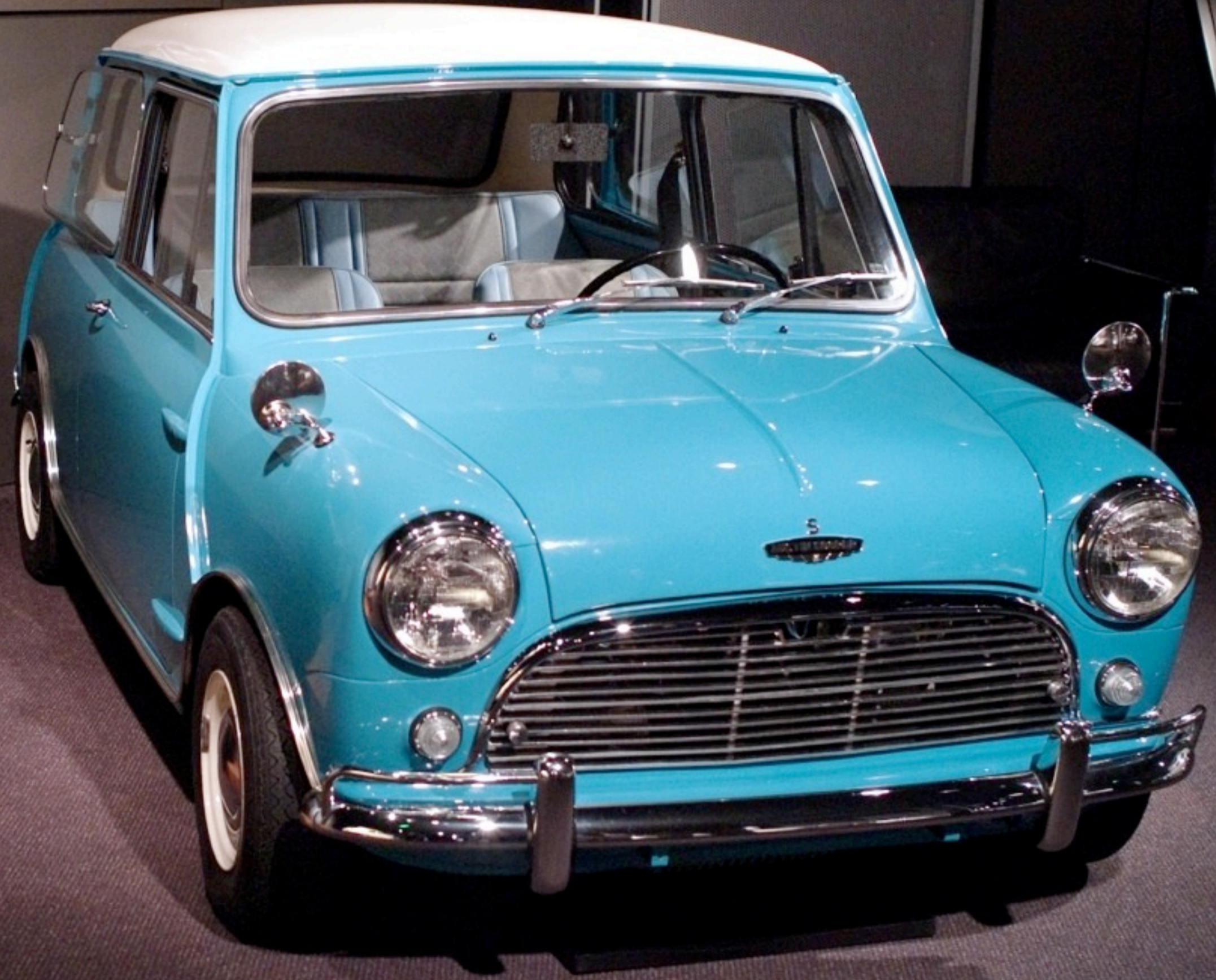the myth of the Newtonian designer
design and the *tabula rasa*

AUSTIN COOPER

AUSTIN
1964 Cooper S

innovation
and myths of invention

Edison and the lightbulb

d.

T. A. EDISON.
Electric-Lamp.

No. 223,898.   Patented Jan. 27, 1880.
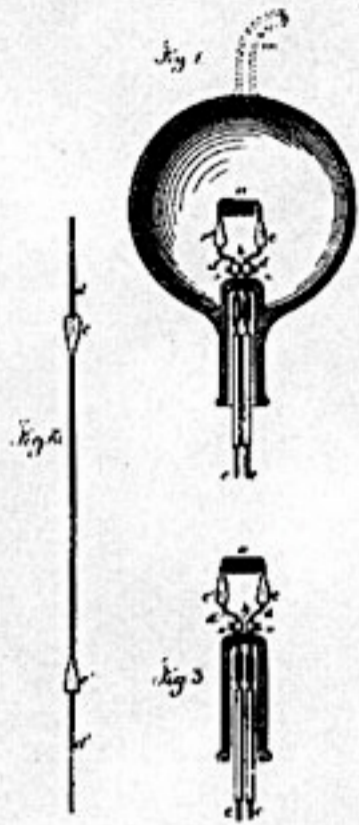
d.

innovation and design

all messy problems demand
interdisciplinary/transdisciplinary address

this has to be collaborative

d.

collaborative innovation?

organic?
smart mobs
crowd sourcing
cognitive surplus

digital Humanities and digital culture

Stanford d.school

human-centered design
"design thinking"

human-centered design

anthropometrics
ergonomics
human factors
(behavioral psychology and cognitive science)

human-centered design needs the Humanities

to complement the focus on anthropometrics and behavior

design is in need of a broader conception of human being and the world of things

Digital Humanities - complementarity of quantitative and qualitative methodologies
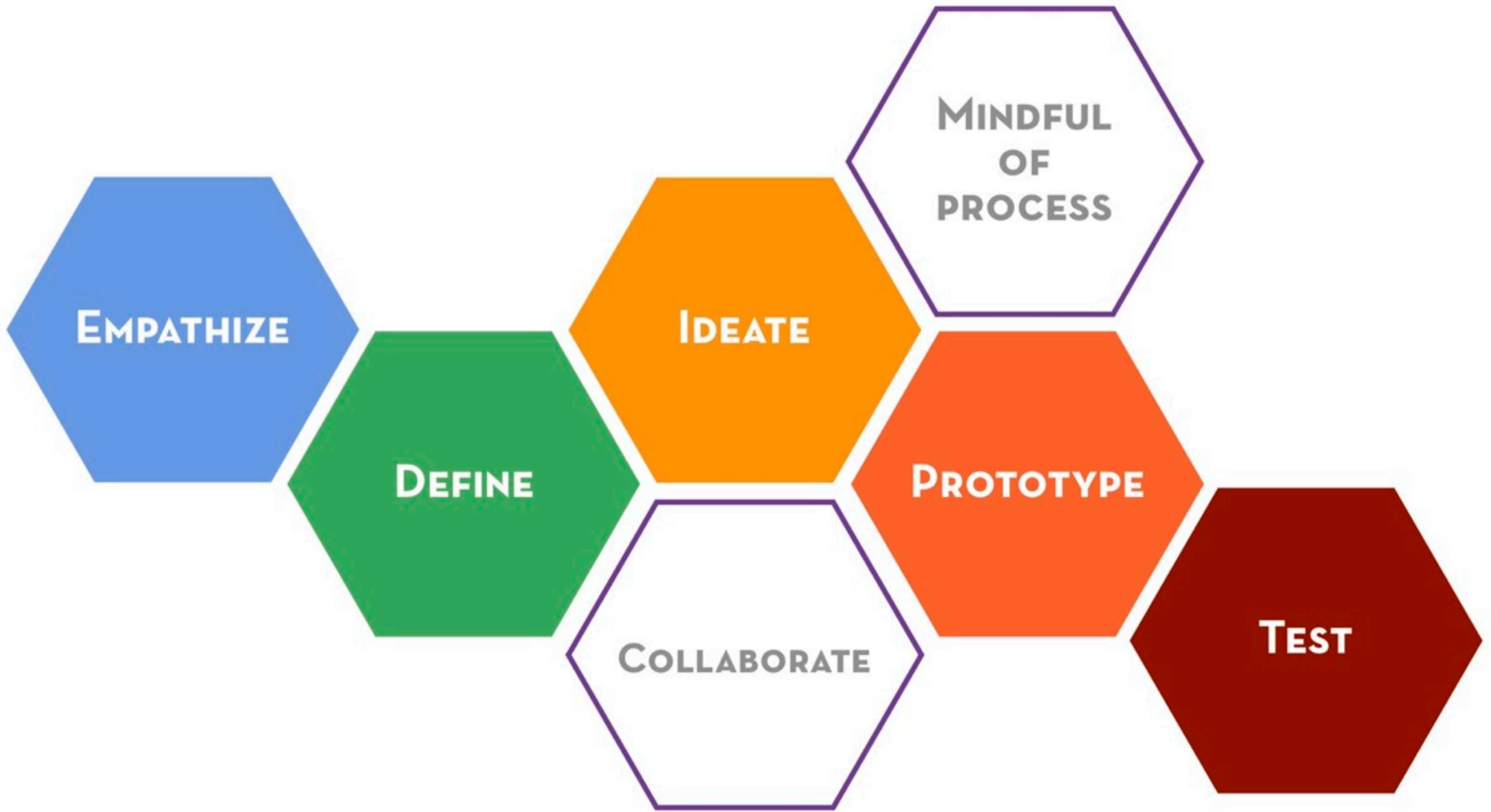
d.

RES PUBLICA
(constitutional arrangement)

social relations | representation

PRAXIS
(thoughtful/informed practice)

←   theory | design process | iteration   →

specialized expertises

problem | design brief | challenge

ISSUES
(articulating themes)

MINDFULNESS

d.
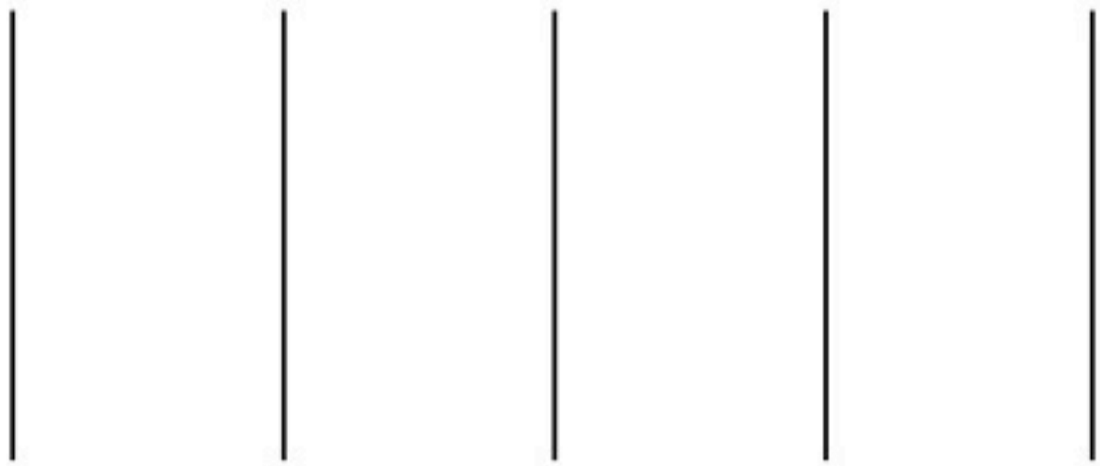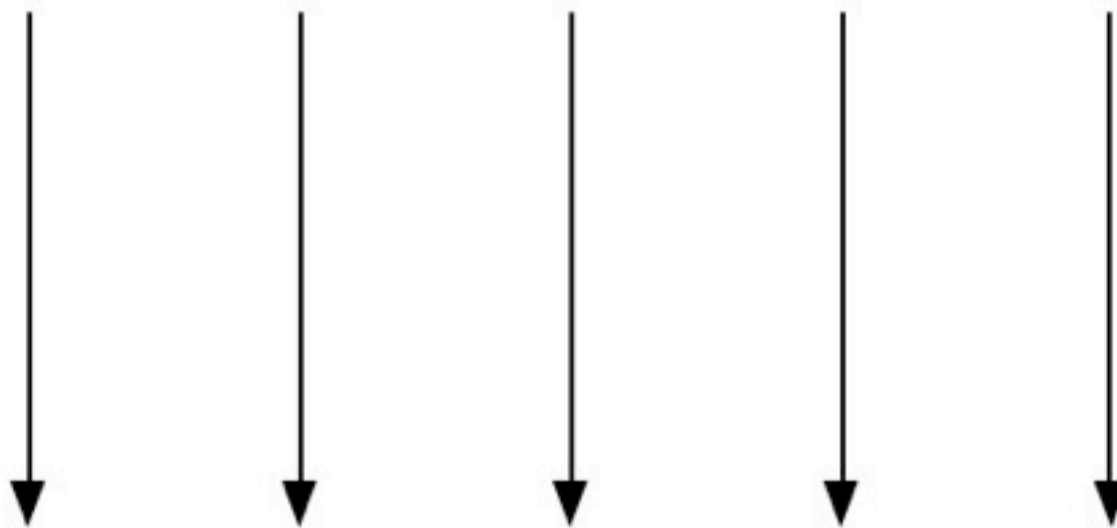
Revs Program at Stanford

human centered design of the automobile
design mobilized through history
automotive archaeologies of the contemporary past
the museum as design studio

auto-biography

Eddie and Joan Hall's Bentley

human experience

research and practice
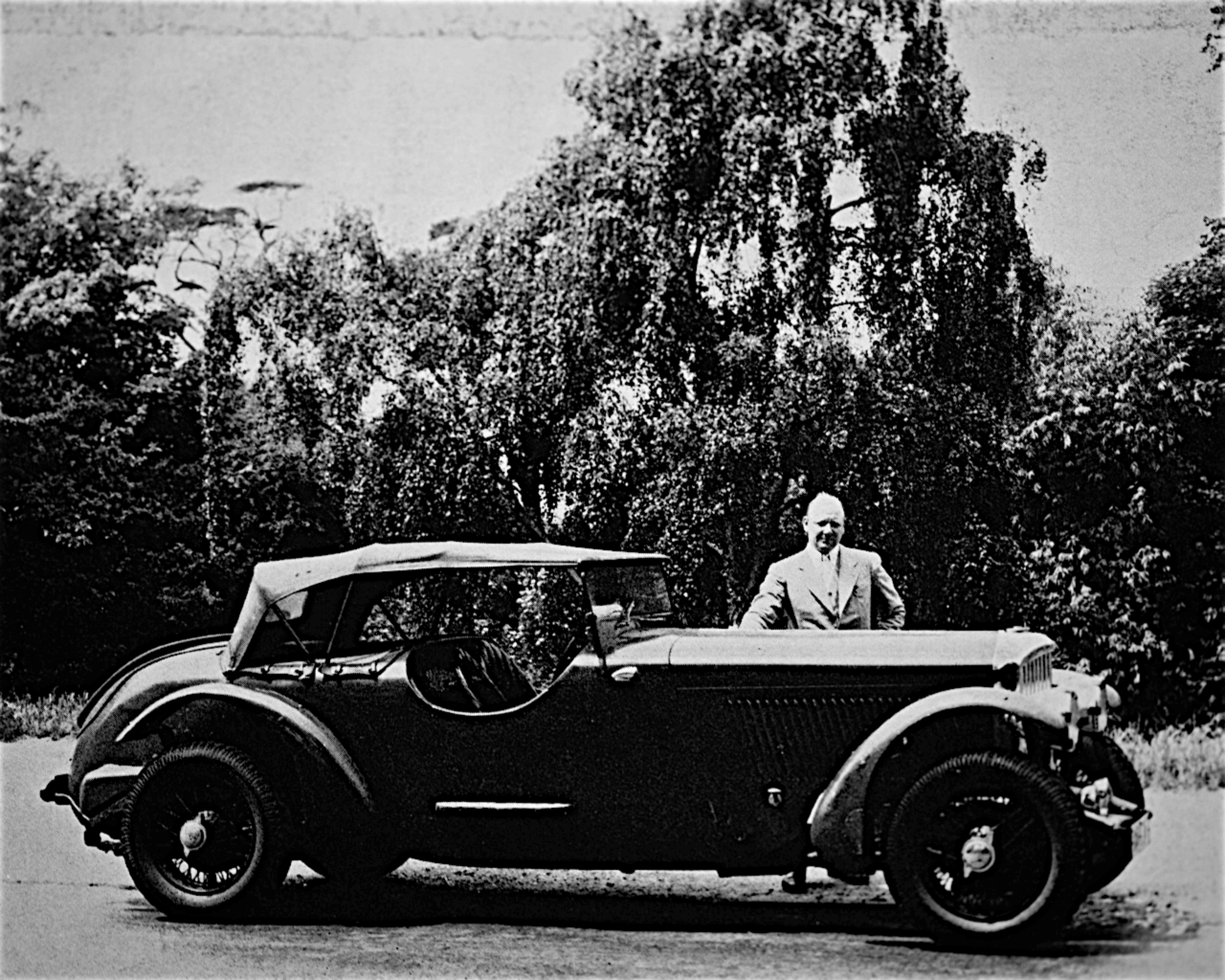
Tuesday May 8th/1934
Bentley 3½. AXN.373
Any semi dull morning Hood raised +
Zouave Jacn + light luggage. Cross Wind.
Dept Hartley 5·20   h.g. mins.
                        0   0
Barnsley   5·33   13
Doncaster   5·49   29
Retford   6·8   48
Samston   6·10   50
Newarkn   6·24   1·4
Grantham   6·35   1·15
Stamford   6·53   1·33
Buchden   7·20   2·00
Biggleswade   7·33   2·13
Baldock   7·40   2·20
29 miles from L 7·48   2·28
Hendon Central Stdis 8·40 2·50
Berkeley Court 8·18   2·58

d. ⚙⚙⚙⚙✳
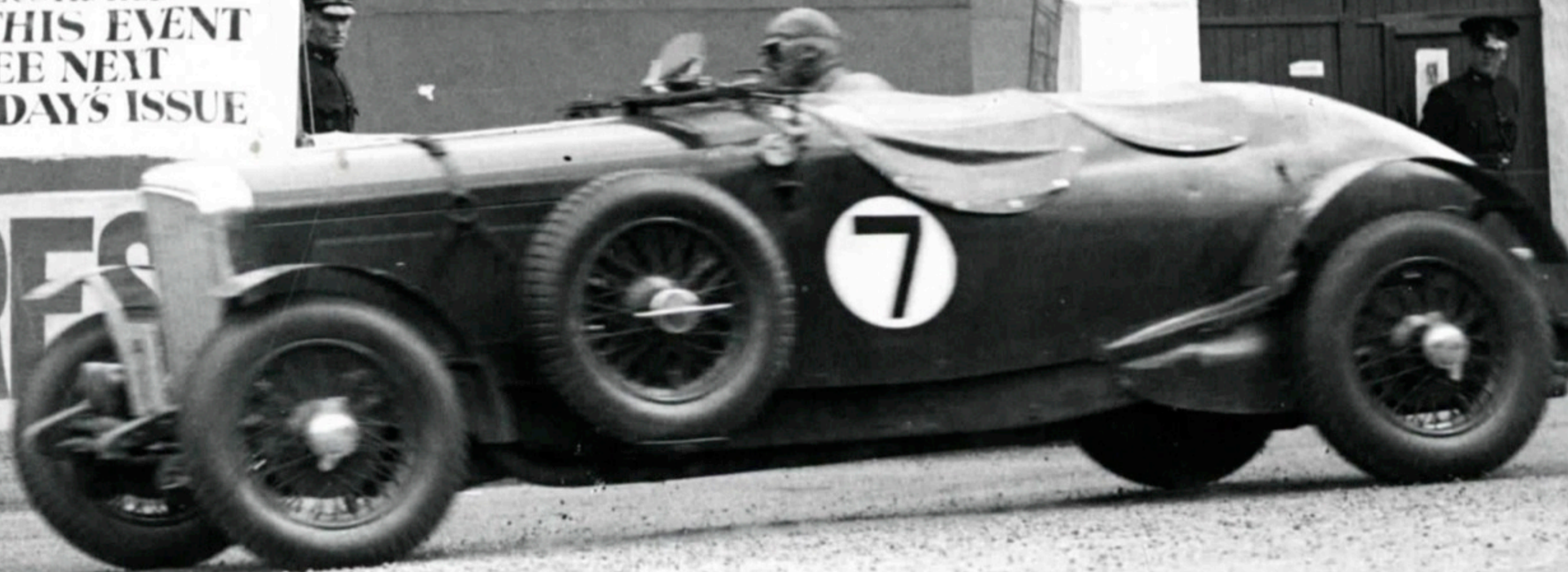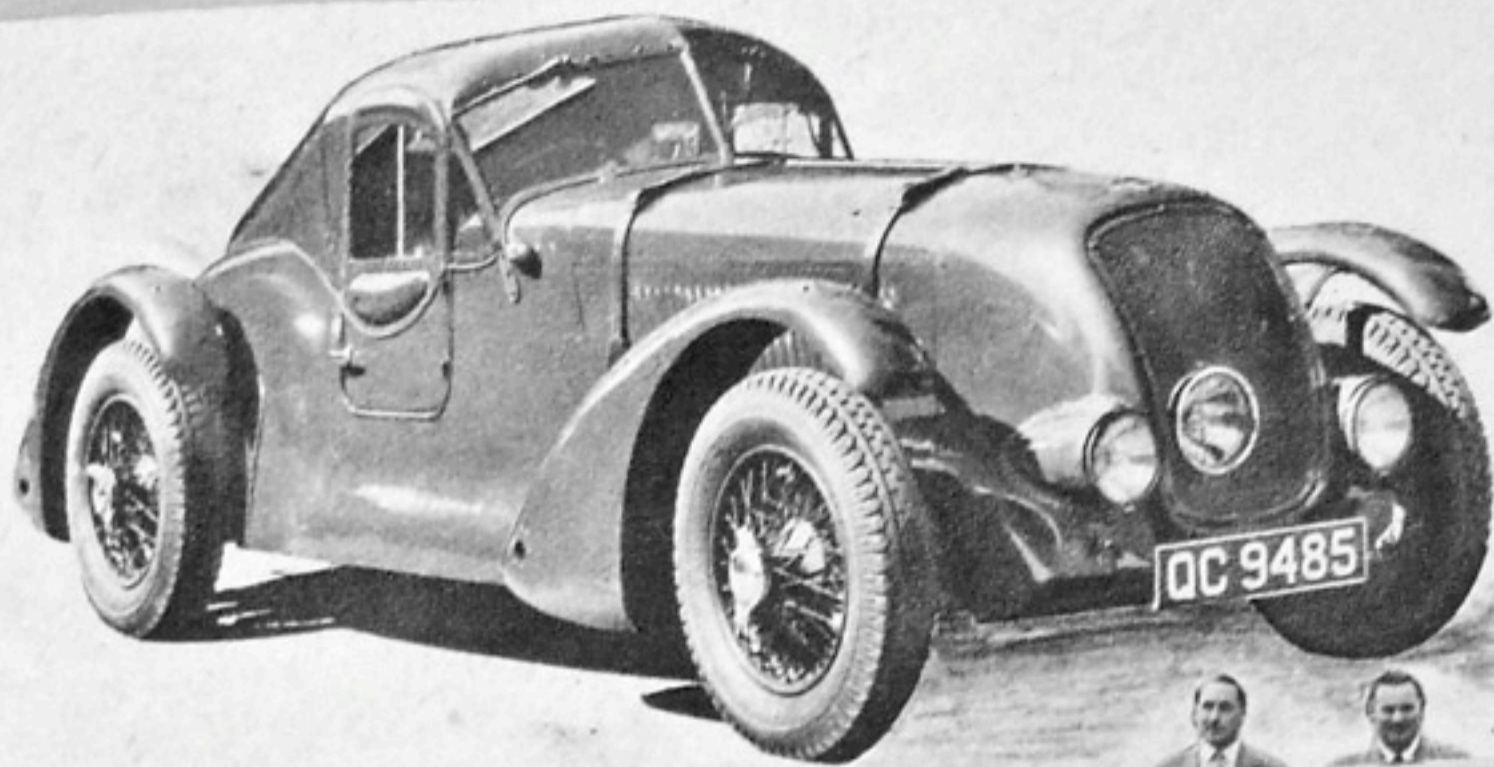
LE MANS NEXT WEEK

Entries for French Classic

Above: E. R. Hall's famous Bentley, in which he finished second in the T.T. races of 1934-5-6, in the new guise in which it will run at Le Mans.
Below : One of the team of three Aston Martins, together with some of the drivers and others concerned: l. to r., Jack Fairman, J. Stirling (director, A M, Ltd.), George Abecassis, John Wyer (team manager), Eric Thompson, Charles Brackenbury, Lance Macklin and James Watt (assistant general manager, A M, Ltd.).

IN eight days' time the curtain will go up on what is still the most famous sports car race in the world—the 24-hour endurance race at Le Mans, organized by the Automobile Club de l'Ouest, and run over the famous 8.4-mile Circuit de la Sarthe. This year's race, commencing at 4 p.m. on Saturday, June 24, and finishing at the same time on the following day, is the eighteenth of the series, and should be as closely fought and exciting as any that have previously been held. Among the entries are three Lago Talbots, two Delahayes, six Ferraris, two Cadillacs, a Cadillac-engined Allard, three XK120 Jaguars, the works team of three Aston Martins, two Frazer-Nashes, the Delage that finished second last year, and the fully faired, Nash-engined, Silverstone Healey.

Then, in addition, there is a positive flock of the amazing Simca-Gordinis, with the formidable combination of the Argentinian drivers, Fangio and Gonzales, sharing one car, while interesting from the British point of view are the first competition appearance of the new Javelin Jupiter and the welcome return to racing of Eddie Hall with

his 4½-litre Bentley of T.T. renown.

Among the well-known British drivers taking part are Leslie Johnson, Peter Walker and Peter Clark, with the Jaguars; H. J. Aldington, with the Mille Miglia Frazer-Nash; Norman Culpan, with the Le Mans Frazer-Nash, in which (partnered by Aldington) he finished third last year; while the formidable Aston Martin team includes Reg Parnell, George Abecassis and Charles Brackenbury.

The B.B.C. is broadcasting from the circuit in the Light Programme at the following times: *Saturday*, 3.50 to

4.10 p.m., 6.35 to 6.45 p.m., 10.15 to 10.20 p.m. *Sunday*, 8.55 to 9 a.m., 12.30 to 12.45 p.m., 3.45 to 4.05 p.m. For the benefit of those desiring to visit the race, Air Enterprises, Ltd., of Croydon (Croydon 3826) are running a special charter service from Croydon airport, returning on the Sunday evening, at a return fare of £12 12s. Following traditional practice, *The Autocar* pit will once more contain a restaurant for the convenience of the British contingent, while on the far side of the circuit the Hotel de l'Hippodrome's restaurant will also provide meals and refreshments.

ENTRIES
(Listed under countries of manufacture)

U.S.A.: Cadillac 5,439 (2) (Briggs Cunningham).
GREAT BRITAIN (16): Allard 5,434 (Allard - T. Cole); Bentley 4,257 (E. R. Healey); Jaguar 3,441 (P. Clark) (P. D. C. Walker); Jaguar 3,441 (L. Johnson); Aston Martin 2,580 (G. Abecassis - L. Macklin); Aston Martin 2,580 (J. Fairman - E. Thompson); Aston Martin 2,580 (C. Brackenbury - R. Parnell); Healey 2,443 (N. H. Mann); Riley 2,443 (Lawrie); Frazer-Nash 1,971 (H. J. Aldington); Frazer-Nash 1,971 (N. R. Culpan - P. Wilson, R.N.); Javelin-Jupiter 1,496 (H. ...ley); M.G. 1,244 (G. E. Phillips).
FRANCE (31): M.A.P. Diesel 4,992 (M...); Talbot 4,483 (L. Rosier-P. Rosier); Talbot ... (A. Chambas - L. Morel); Talbot 4,483 (P. Meyrat - G. Mairesse); Delahaye 4,455 (E. Chaboud - ...haye 4,455 (L. Pozzi - R. Flahault); Diesel 4,385 (Delettrez - Delettrez); Del... (H. Louveau); Simca - Gordini 1,459 (...Gonzales); Simca - Gordini 1,459 (M. ...tignant - R. Manzon); Simca-Gordini ... (A. Gordini - A. Simon); Simca-Gordini ...); Peugeot 1,290 (P. ...); Simca-Gordini 1,221 (G. Scaron - R. ...); Simca - Gordini 1,092 (R. Loyer - J. Behra); 1,091 (N. J. Mahe); Simca 1,098 (Mmes ...Gordini); Renault 760 (J. E. Vernet); ...760 (J. L. V. Sandt); Renault 760 (M. ...); Renault 760 (J. Tacel); Ferry 747 (S... Ferry); Monopole 611 (Monopole); Mono... (J. Savoye); Dyna-Panhard 611 (G. ...); Dyna-Panhard 611 (A. Lachaize); Dyna-... 611 (R. Gaillard); Dyna-Panhard 611 (L. ...); D.B. 611 (2) (Automobiles D.B.); Simca ... Baboin).
ITALY (7): Ferrari 2,340 (Lord ...); Ferrari 2,340 (L. Chinetti); Ferrari 1,995 (...); Ferrari 1,995 (Rubirosa); Ferrari 1,9... Simon); Ferrari 1,995 (R. A. Bouchard); ... (J. Brault).
SWEDEN (1): Svenska-Champion ... Trouis).
CZECHOSLOVAKIA (3): Skoda 1,08... Skoda); Aéro-Minor 749 (J. Poch); Aéro-... (Usine Letnany).
RESERVES: Renault 660 (C. Hardy); R... (A. Gondron); D.B. 1,911 (Automobil... Ferry 747 (Société P. Ferry); Delage ... Veuillet); Simca 1,100 (A. Guillard).

d.

Vehicle Instrumentation

Characterizing the evolution of vehicle dynamics and driver-vehicle interaction
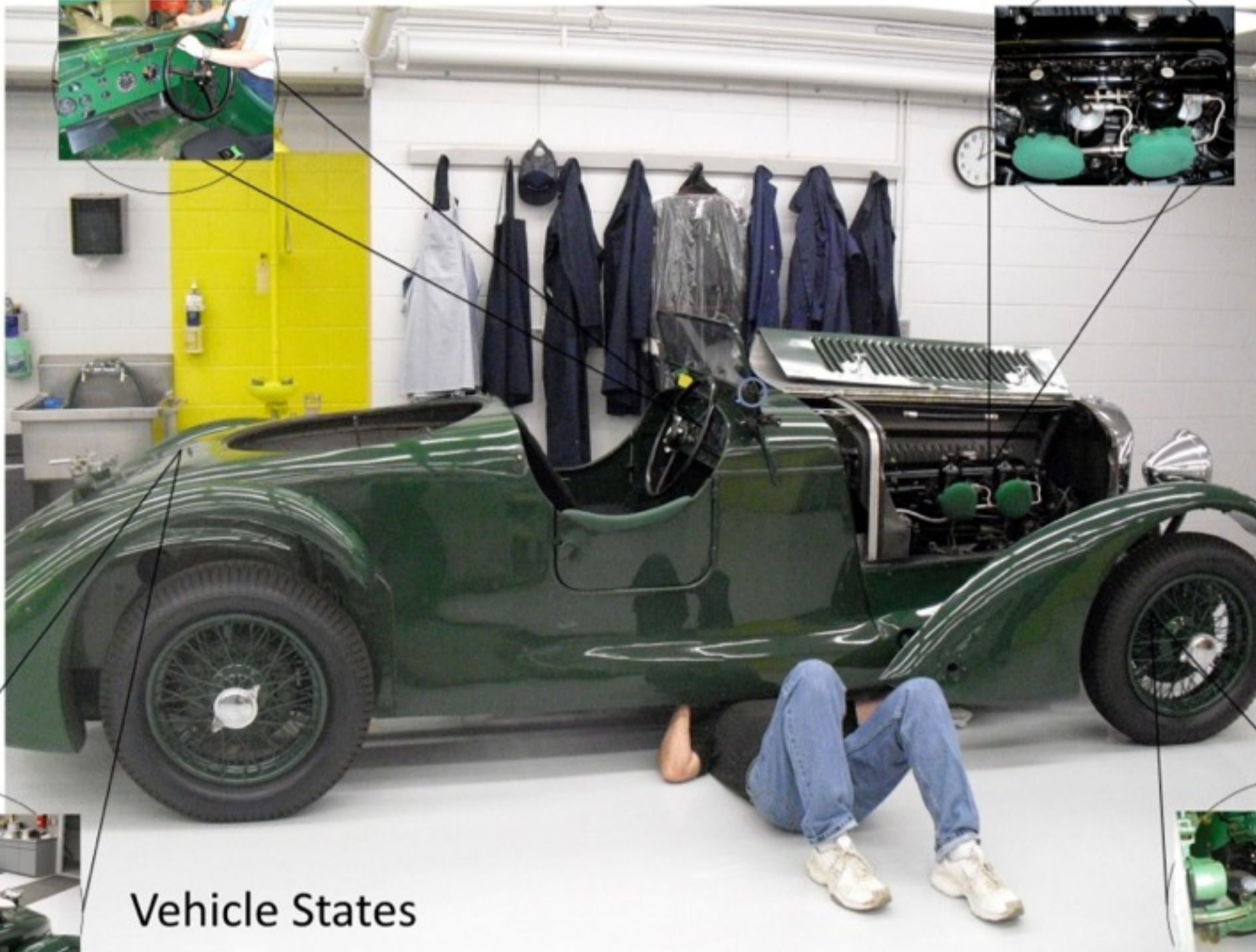
Driver Inputs

- Handwheel angle
- Throttle position
- Brake pedal force
- Clutch pedal force

The driver is an integral part of the racing equation, and recording the driver's behavior in conjunction with the vehicle's response will provide invaluable information regarding racing techniques.
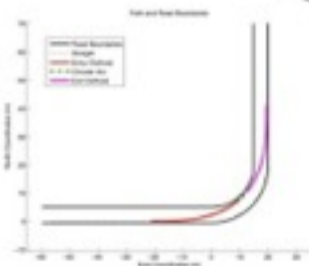
## Engine

- Crankshaft RPM

Vehicle States

- Vehicle path & velocity profile
- Vehicle accelerations & rotation rates
- Wheel speeds

By observing the state of the vehicle, we can record and analyze the overall vehicle behavior and dynamics. This allows us to view the effects of each subsystem from a broad perspective and give insight to the driver-vehicle interaction as a whole. Additionally we will gain knowledge as to how driving styles have evolved alongside advancements in vehicle design.

Suspension System

- Chassis acceleration
- Wheel acceleration
- Suspension travel
- Tire deflection
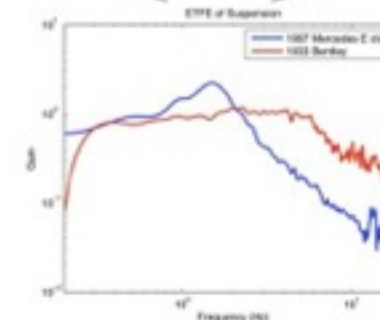
With the suspension system, we are interested in several parameters that affect the handling and performance of the vehicle. Using this information we can explore the evolution of suspension design and the resulting driving characteristics of various automobiles.

d.

the future of automobility

understanding the human experiences

as well as the technological challenges

d.

Tour our New Home!

Take a tour of our new digs, **Building 550**, with the team that designed it.

Big Picture

We use design thinking to drive multidisciplinary innovation

MORE →

Projects

We bring people together to tackle difficult, messy projects

MORE →

People

We take a human approach to design, business & engineering

MORE →

Participate

Work with us, spread the word, and invest in the d.school

MORE →

About Us

What's new, and how to get in touch with us

MORE →

d.MANIFESTO ⇝ All you need to know On a napkin.
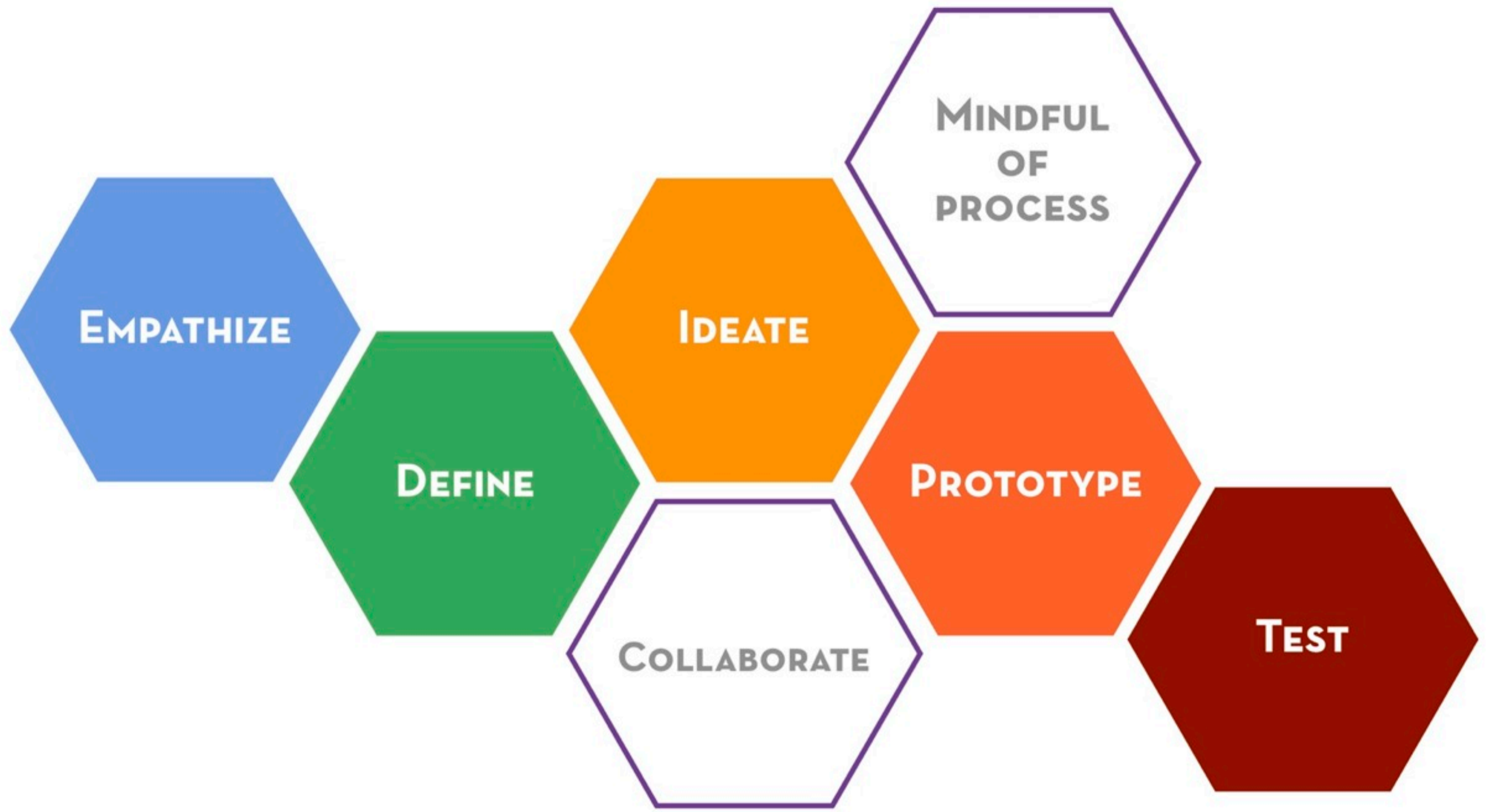
d.NEWS ⇝ f 🐦 📶 ❄

design thinking

a process - modus operandi - a menu of methods
a pragmatics
(know-how applied to particular situations/objectives)

in creative productive authorship

simultaneously research, pedagogy, practice

d.

BAY STUDIO

- my doctor (vs) my doctors

Solution Bucket
- disposable toys for kids
- waiting community (super efficient)
  - MM, bank, post office waiting
- gallery waiting room
- dining waiting room
- restaurant buzzer
- PAMF newsletter
- "pushing" information to patients

disposable toys / germ-resistant toys

- feel good PSR, in charge of "faking" the Dr./patient relationship

Analogy
Planned Parenthood
Rape victim
Injured animal

KID MASKS
- INTERESTED
- COLORFUL
- ANI PATTERNED
- HOLIDAY MASKS
- SCARY/COUGH

VULNERABLE
FAST DATE
I love you
PUBLIC SPEAKING
JOB INTERVIEW
SOMEONE HAS A CRUSH ON YOU

— kid bust-wetting
— confessional booth

Prototype Bucket
- mask wearing experiment "Mother Bear" cues
- unpredictable wait time — your wait time out of a next 5 times during visit
- "We've been waiting for you" greeting
- King's crown "assistant in waiting room"
- photo of a living room transformed

- nametags?
- privacy booth?

POV
For P
they need

1. In a
2. feel with

Protector need to also protect +

the ♡ with a patient

who — sponse
what — giving the greatest gift to + caring
parent — + risk Se
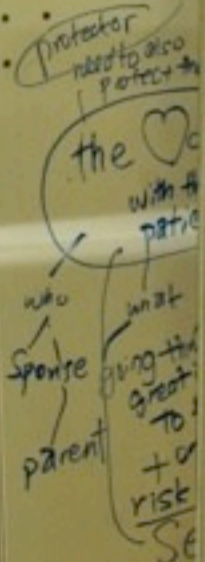
Desire for the

Social Entrepreneurship Laboratory

K-12 Laboratory

G3

d.

STANFORD DESIGN PROGRAM

01 Our Vision

"We are creating the next generation of designers and thought-leaders who will design solutions to the complex challenges facing industry, society, and our planet."

The Stanford Design Program is at the forefront of defining the direction of the field which is in the midst of a profound shift.

We are developing new transdisciplinary methodologies to address issues such as energy, widespread behavior change, and complex business challenges.

Our graduates are being equipped with skills and mindsets that enable them to assume highly leveraged roles and lead strategic initiatives.

read more

d.

Project 1 - Notebook

Project 2 - Notebook
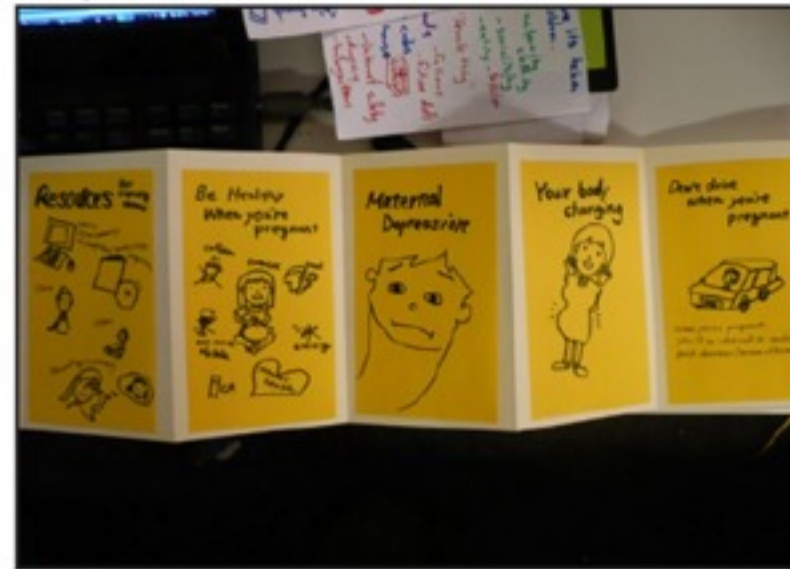
Prototype

Prototype Demo

Project 3 - Notebook

Project 3 - Notebook

Project 3 - Notebook

Project 3 - Notebook

TRANSFORMATIVE DESIGN

d.

WHY storytelling over other forms of communication?

It seems stories are hard wired into our psyche. People have been passing information along via storytelling for as long as humans have had a rich language to draw from. Stories are great at connecting with ideas at a

EXTREME USERS

WHY engage with extreme users

Designers engage with users (people) to understand their needs and gain insights about their lives. We also draw inspiration from their work-arounds and frameworks. When you speak with and observe extreme

Randy Wood in
Nashville repairs
the neck

Dick Boak in
Pennsylvania repairs
internal bracing

Snuffy Smith in North
Carolina repairs
flood damage

Frank Ford from
Palo Alto repairs
the tuners

Richard Hoover in
Santa Cruz repairs
the back

Purchased from
legendary
Clarence White

Flood damage in a
basement: CRACKS!

Richard Hoover
makes a signature
Tony Rice model
guitar

"It was the only
guitar I had."

Tours regularly
with guitar

Tony "retires"
guitar from the
road

1970   1971   1973   1976   1970s -   1993   1993 -   1995   2004
                                    1990s   2003

WHY use a journey map

To gain empathy for a person or understand of one's process through an experience, consider the details of

Define

> "Framing the right problem is the only way to create the right solution."

WHAT is the Define mode

The Define mode of the design process is all about bringing clarity and focus to the design space. It is your chance, and responsibility, as a design thinker to define the challenge you are taking on, based on what you have learned about your user and about the context. After becoming an instant-expert on the subject and gaining invaluable empathy for the person you are designing for, this stage is about making sense of the widespread information you have gathered.

The goal of the Define mode is to craft a meaningful and actionable problem statement – this is what we call a point-of-view. This should be a guiding statement that focuses on insights and needs of a particular user, or composite character. Insights don't often just jump in your lap; rather they emerge from a process of synthesizing information to discover connections and patterns. In a word, the Define mode is sensemaking.

WHY define

The Define mode is critical to the design process because it results in your point-of-view (POV): the explicit expression of the problem you are striving to address. More importantly, your POV defines the RIGHT challenge to address, based on your new understanding of people and the problem space. It may seem counterintuitive but crafting a more narrowly focused problem statement tends to yield both greater quantity and higher quality solutions when you are generating ideas.

The Define mode is also an endeavor to synthesize your scattered findings into powerful insights. It is this synthesis of your empathy work that gives you the advantage that no one else has: discoveries that you can leverage to tackle the design challenge; that is, INSIGHT.
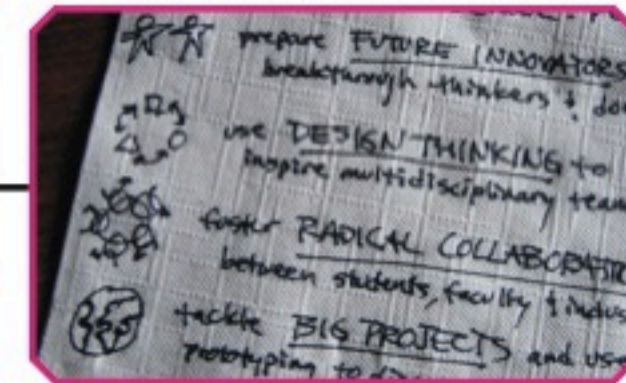
Articulate the meaningful challenge

HOW to define

Consider what stood out to you when talking and observing people. What patterns emerge when you look at the set? If you noticed something interesting ask yourself (and your team) why that might be. In asking why someone had a certain behavior or feeling you are making connections from that person to the larger context. Develop an understanding of the type of person you are designing for – your USER. Synthesize and select a limited set of NEEDS that you think are important to fulfill; you may in fact express a just one single salient need to address. Work to express INSIGHTS you developed through the synthesis of information your have gathered through empathy and research work. Then articulate a point-of-view by combining these three elements – user, need, and insight – as an actionable problem statement that will drive the rest of your design work.

A good point-of-view is one that:
- Provides focus and frames the problem
- Inspires your team
- Informs criteria for evaluating competing ideas
- Empowers your team to make decisions independently in parallel
- Captures the hearts and minds of people you meet
- Saves you from the impossible task of developing concepts that are all things to all people (i.e. your problem statement should be discrete, not broad.)

Transition: Define >> Ideate

In the Define mode you determine the specific meaningful challenge to take on, and in the Ideate mode you focus on generating solutions to address that challenge. A well-scoped and -articulated point-of-view will lead you into ideation in a very natural way. In fact, it is a great litmus test of your point-of-view to see if brainstorming topics fall out your POV.

A great transition step to take is to create a list of "How-Might-We . . .?" brainstorming topics that flow from your problem statement. These brainstorming topics typically are subsets of the entire problem, focusing on different aspects of the challenge. Then when you move into ideation you can select different topics, and try out a few to find the sweet spot of where the group can really churn out a large quantity of compelling ideas.

Test

"Testing is an opportunity to learn about your solution <u>and</u> your user."

WHAT is the Test mode

The Test mode is when you solicit feedback, about the prototypes you have created, from your users and have another opportunity to gain empathy for the people you are designing for. Testing is another opportunity to understand your user, but unlike your initial empathy mode, you have now likely done more framing of the problem and created prototypes to test. Both these things tend to focus the interaction with users, but don't reduce your "testing" work to asking whether or not people like your solution. Instead, continue to ask "Why?", and focus on what you can learn about the person and the problem as well as your potential solutions.

Ideally you can test within a real context of the user's life. For a physical object, ask people to take it with them and use it within their normal routines. For an experience, try to create a scenario in a location that would capture the real situation. If testing a prototype in situ is not possible, frame a more realistic situation by having users take on a role or task when approaching your prototype. A rule of thumb: always prototype as if you know you're right, but test as if you know you're wrong—testing is the chance to refine your solutions and make them better.

WHY test

To refine prototypes and solutions. Testing informs the next iterations of prototypes. Sometimes this means going back to the drawing board.

To learn more about your user. Testing is another opportunity to build empathy through observation and engagement—it often yields unexpected insights.

To refine your POV. Sometimes testing reveals that not only did you not get the solution right, but also that you failed to frame the problem correctly.

The key to user testing is <u>listening</u>.

HOW to test

Show don't tell. Put your prototype in the user's hands - or your user within an experience. And don't explain everything (yet). Let your tester interpret the prototype. Watch how they use (and misuse!) what you have given them, and how they handle and interact with it; then listen to what they say about it, and the questions they have.

Create Experiences. Create your prototypes and test them in a way that feels like an experience that your user is reacting to, rather than an explanation that your user is evaluating.

Ask users to compare. Bringing multiple prototypes to the field to test gives users a basis for comparison, and comparisons often reveal latent needs.

Iteration and making the process your own

Iteration is a fundamental of good design. Iterate both by cycling through the process multiple times, and also by iterating within a step—for example by creating multiple prototypes or trying variations of a brainstorming topics with multiple groups. Generally as you take multiple cycles through the design process your scope narrows and you move from working on the broad concept to the nuanced details, but the process still supports this development.

For simplicity, the process is articulated here as a linear progression, but design challenges can be taken on by using the design modes in various orders; furthermore there are an unlimited number of design frameworks with which to work. The process presented here is one suggestion of a framework; ultimately you will make the process your own and adapt it to your style and your work. Hone your own process that works for you. Most importantly, as you continue to practice innovation you take on a designerly mindset that permeates the way you work, regardless of what process you use.
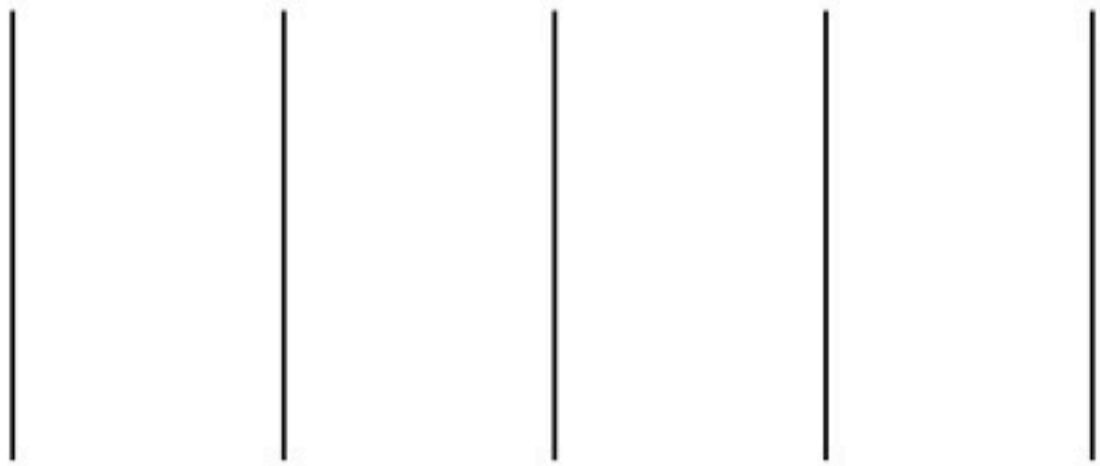
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RES PUBLICA

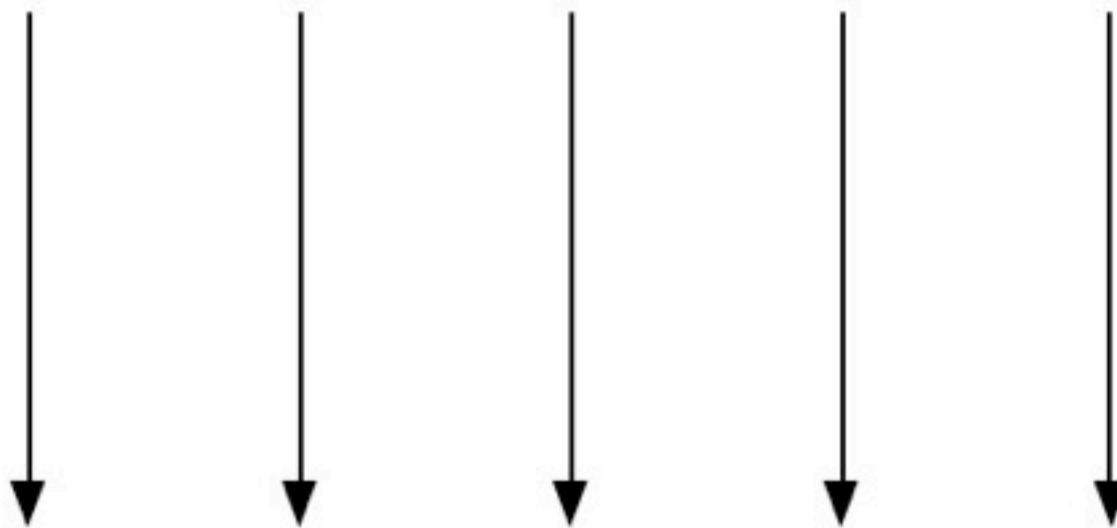(constitutional arrangement)

social relations | representation

PRAXIS

(thoughtful/informed practice)

theory | design process | iteration

specialized expertises

problem | design brief | challenge

ISSUES

(articulating themes)

MINDFULNESS

d.

research-based practice
project-based learning
iterative rapid prototyping
studio centered
agile flat teams
primacy of sociality, listening, mindfulness, care
the importance of theory

d.

What it is to be Human

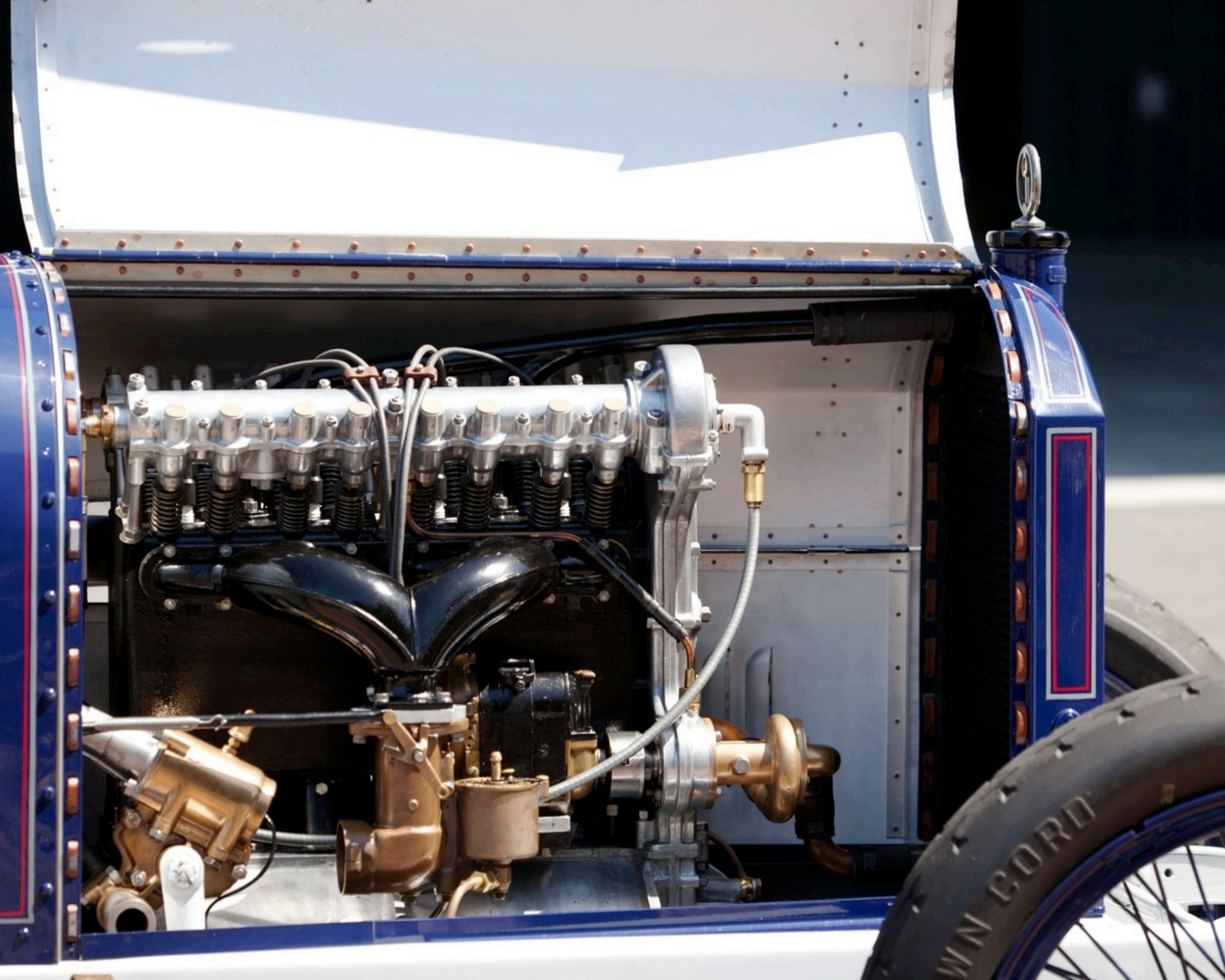Archaeological perspectives on human creativity
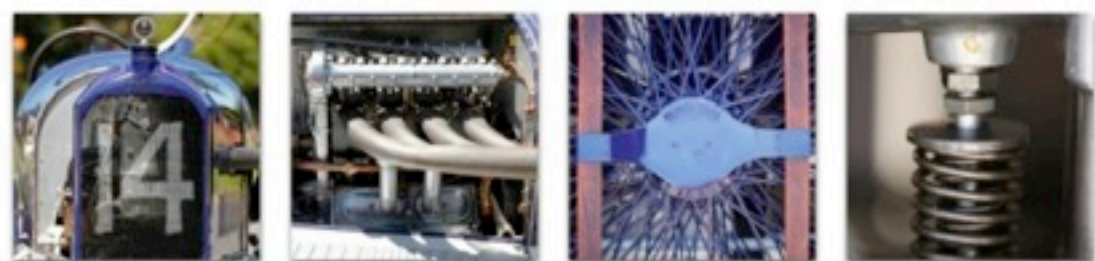
d.

an archaeological standpoint

on making and getting on with things

1913 Peugeot Voiturette

innovation and adoption

1913 Peugeot Bis Coupe de l'Auto Voiturette

"The First Modern Racing Engine"

Les Charlatans

Ernest Henry

The 1913 Peugeot Bis Coupe de l'Auto Voiturette Racing Car was produced outside of Peugeot's official engineering department. Three racers—Georges Boillot, Jules Goux, and Paolo Zuccarelli, unfortunately dubbed Les Charlatans by their detractors—and the Swiss engineer Ernest Henry, designed the car. Many of Henry's innovations came from his work in the aero engine industry. When the light-weight Peugeot 1913 bis debuted, it was considered "the most efficient racing engine ever built" by Automobile in America, and praised by The Autocar in Britain.

George Bolliot - 1st Place

With twin overhead camshafts and four valves per cylinder, the 1913 Peugeot L3 *bis* was truly the first modern racing engine.
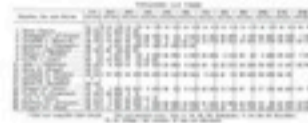
Georges Bolliot drove the car to victory in the 1913 Circuit de Provence. The team went on to win the Coupe de l'Auto. Peugeot's 42nd victory out of the 48 competitions in which it had raced since 1908. The 3-litre Peugeots out-performed cars with engines twice as large. In fact, they were so successful that rivals in the auto industry were clamoring to get their hands on the engines. The engine inspired the likes of Sunbeam, Offenhauser, and Aston Martin.

The Peugeot L3 *bis* as it appeared in Indianapolis, 1914

With twin overhead camshafts and four valves per cylinder, the 1913 Peugeot L3 bis was truly the first modern racing engine.

"A handful of engines have established the basic designs on which most successful racing engines have been based. One of these was the *Grand Prix Peugeot of 1913*."
—John Burgess, curator of the Briggs Cunningham Collection

"This car […] ran a race that put to shame the big specially-constructed racing machines that were designed to come just under the displacement requirement of 450 cubic inches. It was little less than a complete triumph for the small high-speed motor."
—*Automobile*, 4 June 1914

Jacques Menier

Arthur Duray - 2nd Place

Frenchman Jacques Menier bought Georges Boillot's Peugeot and used it as a road car. Not long after acquiring the car, Menier met the racer Arthur Duray, and offered him the use of the Peugeot for the Indianapolis 500 of 1914. René Thomas won in a 6.2-litre Delage, but only 6 laps (or 7 minutes, 21 seconds) ahead of Duray's 3 litre Peugeot, of less than half its size. The little car had remarkably beaten the big works cars of the official Peugeot team. For this it has been nicknamed "The Giant Killer."

When World War I broke out, Menier enlisted as a fighter pilot where was shot down and presumed dead. Although he later returned to France, the Peugeot had been sold in his absence, for the diminutive price of 5,000 francs. Menier had refused 60,000 before the war.

Benny Brandfon

The 1913 Peugeot as it appeared in Ben Brandtons' car lot in the Bronx, 1936. Photograph from Historian Smith Hempstone Oliver.

By the 1930s, the 3-litre Peugeot was owned by Benny Brandton, an American car dealer in the Bronx. Brandton badly adapted the car to dirt track racing. John Burgess of the Cunningham Museum remarked that for Brandton, if something didn't fit, "he'd use a bigger hammer."

The Engineering of the 1913 Peugeot L3 *bis*

"Weighing less than 2000 pounds, the 1913 Peugeot was capable of 100 mph.
—John Burgess, curator of the Briggs Cunningham Collection

"There is a slight tendency to regard the continued success of the Peugeot teams as indicative of the advantages of the overhead valve construction, and doubtless the engines do possess a very high volumetric efficiency."
—*The Autocar*, September 27th, 1913

Outstanding Features of the 1913 Peugeot L3 *bis*:
- Double overhead camshaft engine produced high efficiency
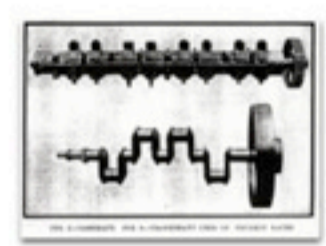- 2-piece crankshaft and ball bearings reduced friction
- Unique lubrication that had only one pump
- 1-piece crankcase made the engine very stiff

First Restoration by Collector Cameron Peck

Briggs Cunningham 1970s: Indianapolis configurations restored.

Eventually, Briggs Cunningham acquired the Peugeot in 1952 and then restored it to its 1914 Indianapolis configuration in the 1970s. Praised at the time as "the ultimate technological exhibit" for the museum, its revolutionary twin camshaft engines and fuel injection are now commonplace features in almost every car.

Miles Collier

Leica M9

what date is this artifact?
path dependencies
tacit knowledge communities
the *distribution* of phenomena

coevolution

our material selves

getting on with stuff

ask - what would I have to do if I didn't have this?

d.

memory and identity

invasion of the body snatchers

time and things

things are not primarily histori(ographi)cal
transiency is the condition of an enduring past
without care and maintenance, without iteration, adaptation,
change, entropy will take hold

d.

ruin, remains and actuality

Bergson and duration
present pasts
the present contains latent pasts ready to be reactivated, in the face of entropy and ruin, precisely through momentary re-articulations

d.

negative entropy

constant re-articulation

digital media

information is a verb
the past has to change if it is to survive

the duality of structure

medium and outcome of iterative practice

creativity

quotidian acts of re-collection

d.

thinking freshly with the Humanities

the importance of the cultural imaginary in an elision of the tangible and the intangible

maintaining a rich storehouse - a manifold of qualities of experience - the Archive

the role in the Archive of re-collection/re-iteration - negative entropy

this is authoring/making - the heart of human agency

the dispersed/distributed character of human being

d.

The Humanities and innovation?

focus - human involvement in things - human being

focus - agency, tradition and change

awareness - of actuality

attitude - located and pragmatic; design oriented (cf methodological, dogmatic, disciplinary)

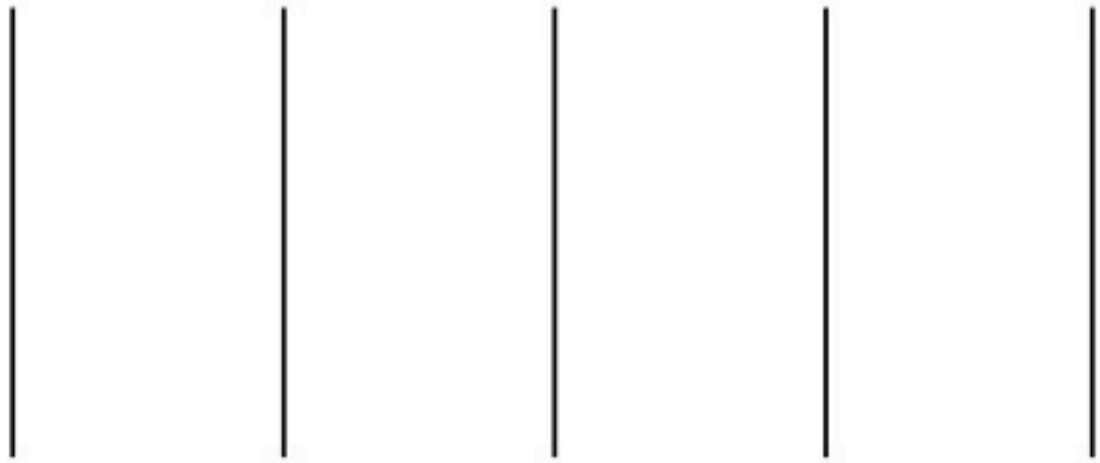*facility* - theory

d.

RES PUBLICA
(constitutional arrangement)

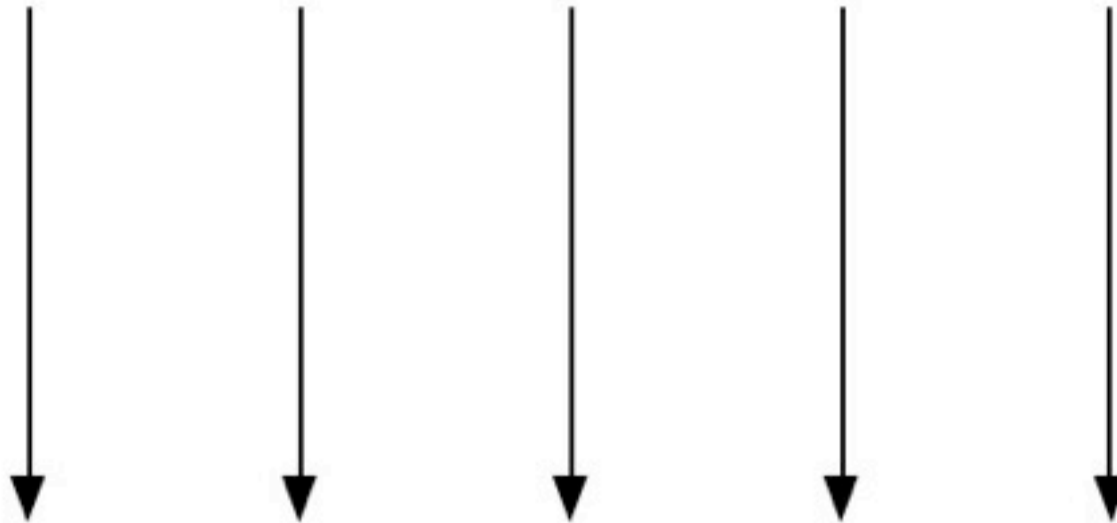social relations | representation

PRAXIS
(thoughtful/informed practice)

← theory | design process | iteration →

specialized expertises

problem | design brief | challenge

ISSUES
(articulating themes)

MINDFULNESS

d.

research-based practice
project-based learning
iterative rapid prototyping
studio centered
agile flat teams
primacy of sociality, listening, mindfulness, care
the importance of theory