



*8<sup>th</sup> meeting*

*International Society for the History of  
Neuroscience 2003*

*9<sup>th</sup> Meeting*

*European club for the History of Neurology*

*Cumberland Lodge*

Gall, Broca & children's brains:  
the impact of localization on 19<sup>th</sup> century  
developmentalists

*Isabelle Barrière*

*Johns Hopkins University & University of Hertfordshire*

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## Aim

Explore the influence of  
localizationists  
on developmentalists  
*beyond*  
child neurology

# Mid-19<sup>th</sup> century

- Beginning of the “modern era” of localization of functions in the brain
- “Golden age” of developmentalists

# Changing childhood in the 19<sup>th</sup> century

- Industrialization
- Institutionalization:  
medical, educational  
and legal sphere



## Localizationists & developmentalists

Gall & Spurzheim (1809)

Voisin (1832)

Séguin (1846)

Broca (1861)

Charcot (1862)

-- Ribot

Parrot (1879)

Bourneville (1884)

Binet (1909)

## Atypical mental development: "Idiocy"

*Early 19<sup>th</sup> century*

*End of 19<sup>th</sup> century*

Godly, Incurable-----→ Organic basis, curable (to a certain extent)

# Localizationist concepts

- Organic basis of the mind/ brain
- Divisibility of the mind/brain → instincts, personality characteristics, faculties
- Innateness
- Heredity

Gall's views on  
brain development, heredity & innateness

*Des dispositions innées de l'âme et de l'esprit*  
(Gall & Spurzheim, 1809, 1811)

- Divisions of instincts, personality characteristics, faculties
- Dispositions of the properties of the soul & the mind are innate & depend on organization
- Faculties and predispositions= innate
- Ideas or sensations= product of faculties, predispositions & environmental influences

## Gall's views on brain development, heredity & innateness

- A theory of the brain implies assumptions about innateness
- Brain= organ of the soul
- Different parts of the brain→ different moral or intellectual faculties
- Parallelism between development of intellectual and moral faculties and growth of organs that underpin them



## Gall's views on brain development, heredity & innateness

- Correlation between growth of organs that underpin faculties & development of faculties → evidence for innateness;
- Causal relation between organic dysfunction & atypical development
- Independent development of different parts of the brain

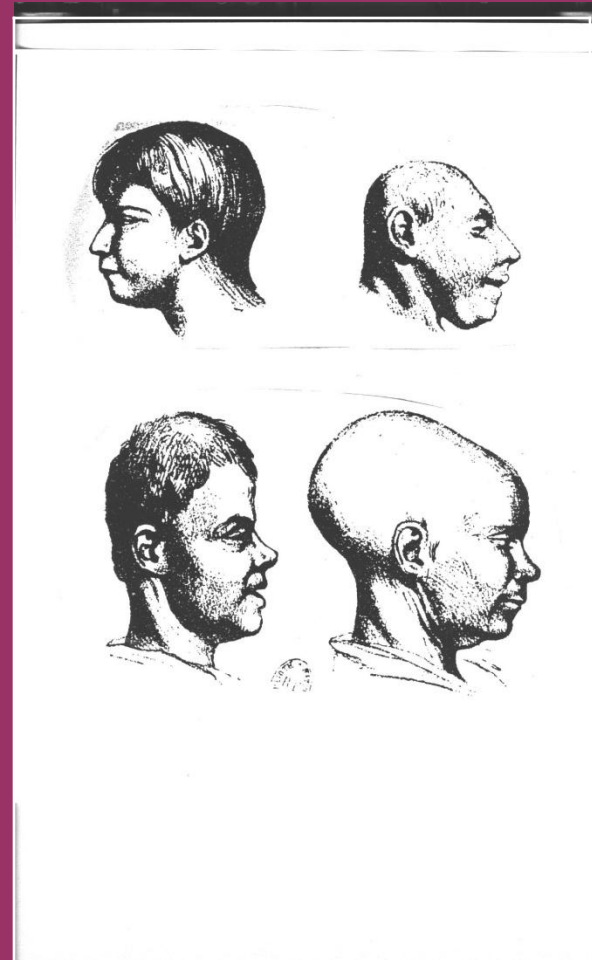
## Gall's views on brain development, heredity & innateness

- Heredity of organs → heredity of faculties & predispositions
- Development of ideas & sensations → product of faculties, predispositions & environment
- Role of education: make up for underdeveloped faculties & predispositions (organic basis)

Gall's views on  
brain development, heredity & innateness

# Consequences

- Debates on correlation between size of brain, bumps & intellectual development
- Ethnically-biased and gender-biased views of this correlation
- Misinterpretation: education relying on use of cephalic corsets etc



# Felix Voisin (1794-1873)

- Trained as an alienist with Pinel and Esquirol
- 1819 Thesis *on the usefulness of courage and moral reaction in diseases*
- Impressed by Gall & Spurzheim (1809)
- 1820 visit of asylum in Bordeaux and Gheel
- Recovered stutterer, studied stuttering— lack of harmony between the vocal organs and the brain
- 1822 Award for work showing brain in control of genital organs
- Anticlericalist, republican
- Founded *l'Institut orthophrénique*, Issy-Les-Moulineaux
- 1833 in charge of epileptic and idiot section, *Hôpital des Incurables*, Paris
- 1839-40 President of the *Société phrénologique*
- 1848 Against capital punishment

## Voisin (1832)

### *Application de la physiologie du cerveau à l'étude des enfants qui nécessitent une éducation spéciale*

#### Journal de la Société Phrénologique de Paris, Vol. 1

- Education must not attempt to suppress instincts (against moral education)
- Liberal education → “harmonic & regular development of all organs and thereby of all faculties” (translation by IB) (those common to man & animals and those unique to man)
- Parallelism between *insane, criminals and great men* → lack of balance/harmonic development of different parts of the brain underpinning faculties
- Appropriate education → better outcome for insane and criminals

# Edouard Séguin (1812- 1880)

- Studied under Itard & Esquirol
- Aimed at challenging assumptions that idiots were incurable
- Did not complete his medical studies in Paris
- Appointed director of idiot-asylum at Bicêtre  
→ work praised by Voisin



## Séguin (1846)

- Cites Gall & Spurzheim , acknowledges their contribution, but rejects some of their ideas
- Idiocy as “an infirmity of the nervous system, which has for its effect the abstraction of the whole or part of the organs and the faculties of the child from the normal action of the will”

## Séguin (1846)

Treatment: physiological education

“The education of the senses must precede the education of the mind”

→ Physiological method:

- a) “Exercise the (imperfect) organs so as to develop their functions”;
- b) “Train the functions so as to develop the (imperfect) organs”



## Séguin (1812- 1880)

- 1848 left France and went to the US;
- Lived in Cleveland & Portsmouth;
- 1861 Graduated MD at New York University College;
- 1862 Member of the American Medical Association;
- 1866, started to study & popularized the use of medical thermometers

## Séguin (1873)

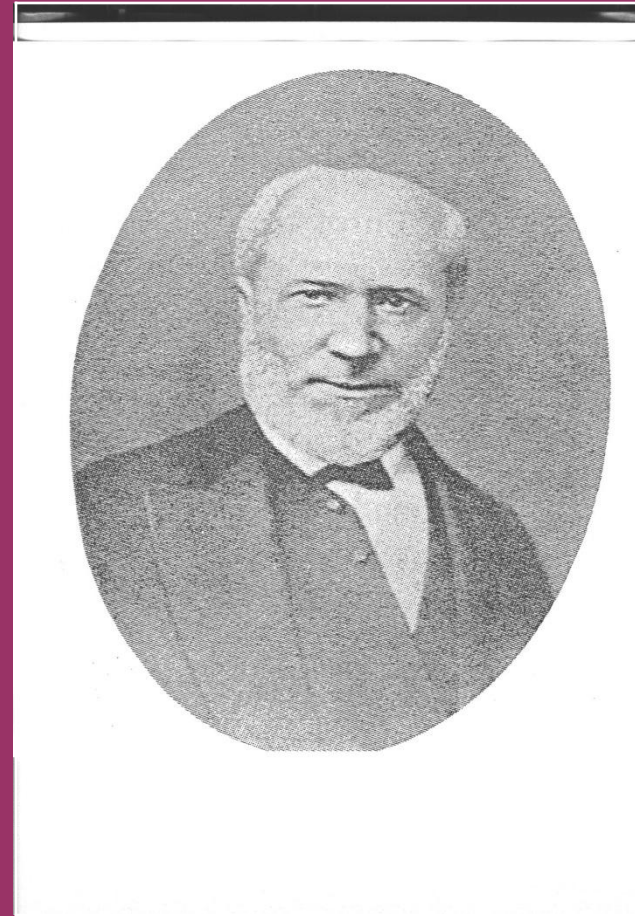
- US Commissioner on Education at the Vienna Universal Exhibition;
- Examined educational systems in most European countries, esp. *kindergartens* in Germany and *salles d'asile* in France;
- Memoir on Garden Schools read before the New York Academy of Science

# Séguin (1812-1880)

## Pedagogical reforms

Develop

- Muscles
- Senses
- Intellect



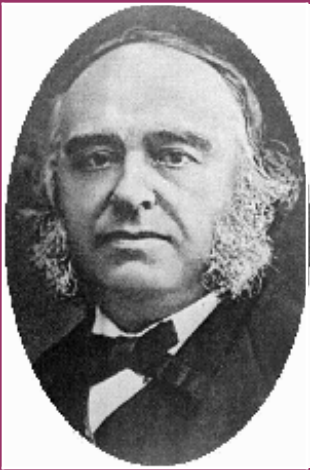
→ Application of his theories to all children, not only idiots.

# Séguin (1812- 1880) as an international pioneer

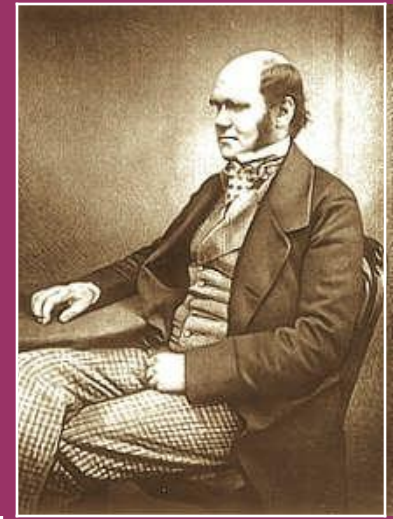
- Thanked by Pope Pius IX
- Impact on Great Britain→ establishments of asylums for idiots in Earlsewood, Colchester & Lancaster;
- Impact on the US→ institutions of state asylums in Massachussetts & New York

# Séguin (1866, 1870)

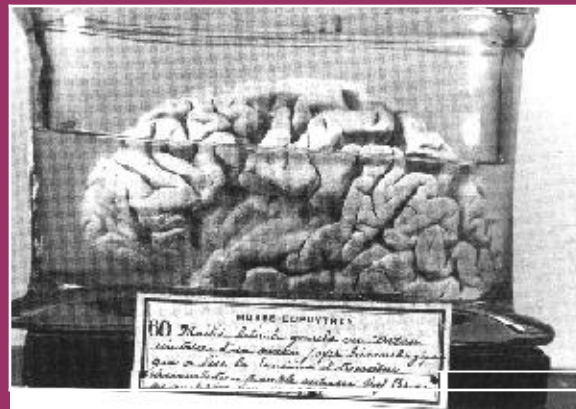
- Brain of idiots: not different in structure, but in lack of growth past a certain age
- Stresses the importance of understanding brain development
- Aware of findings on localization in acquired disorders

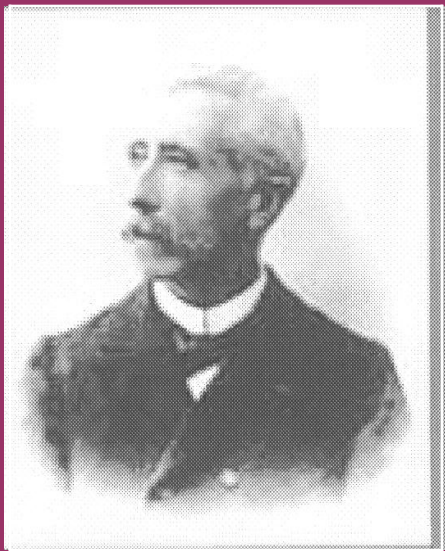


## Mid 19<sup>th</sup> century



- Darwin (1859) Origin of the species
- Broca (1861) Localization of speech





# Ribot's views on Ontogenesis & Heredity

- Influenced by Hartley, Spencer
- Organic basis of behaviour
- Heredity of organs
- Learning: law of associations (strength)
- Parallelism between ontogeny & loss & recovery of functions
- Cognitive functions tied to motor processes through which they are expressed



## Joseph Marie Jules Parrot (1823-1883)

- Studied medicine
- 1852 Prize for *Considération sur le zona*
- 1857 Medical Doctorate
- One of the founders of the *Société de biologie et d'anthropologie*
- 1862 Médecin des hôpitaux
- Worked & published on vascular diseases
- Discoverer of diseases (including congenital syphilis & its symptoms in children)



# Joseph Marie Jules Parrot (1823-1883)



- 1867 *Hospice des Enfants Assistés*
- 1876 Received the chair of the History of Medicine, Faculty of Medicine → 1879 1<sup>st</sup> chair of pediatrics at the *Hospice des Enfants Assistés*
- Member of the *Académie de Médecine*
- 1881 President of *Société de biologie et d'anthropologie*
- Discovered and published on prehistoric caves (Excideuil)

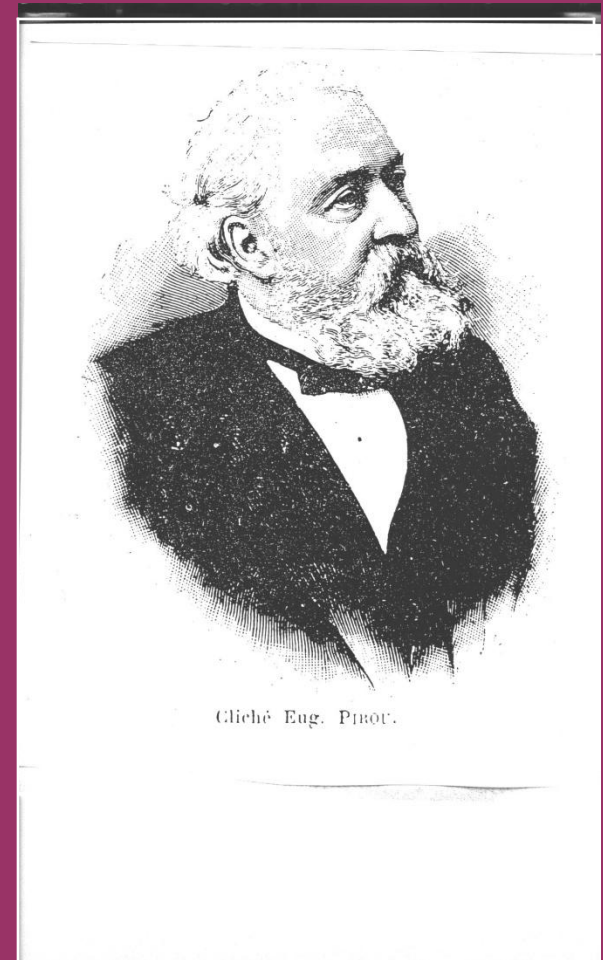
Joseph Marie Jules Parrot  
(1879)

*Sur le développement du cerveau chez les  
enfants du premier âge*

- Cites Broca (1861);
- Study of change of texture and colour of different parts of the brain
- Method: careful categorization of 96 brains according to Chronological Age (taking into account premature birth etc)
- Independent development of each part
- Speed of development of organ correlated with speed of development of faculty that it controls

# Désiré-Magloire Bourneville (1840-1909)

- Trained with Charcot who considers him his son
- Transcribed and published Charcot's lectures
- Edited *l'Iconographie de la Salpêtrière*
- Founder of *Archives de Neurologie & L'Année médicale*
- Involved in social and political debates



Désiré-Magloire Bourneville  
(1884)

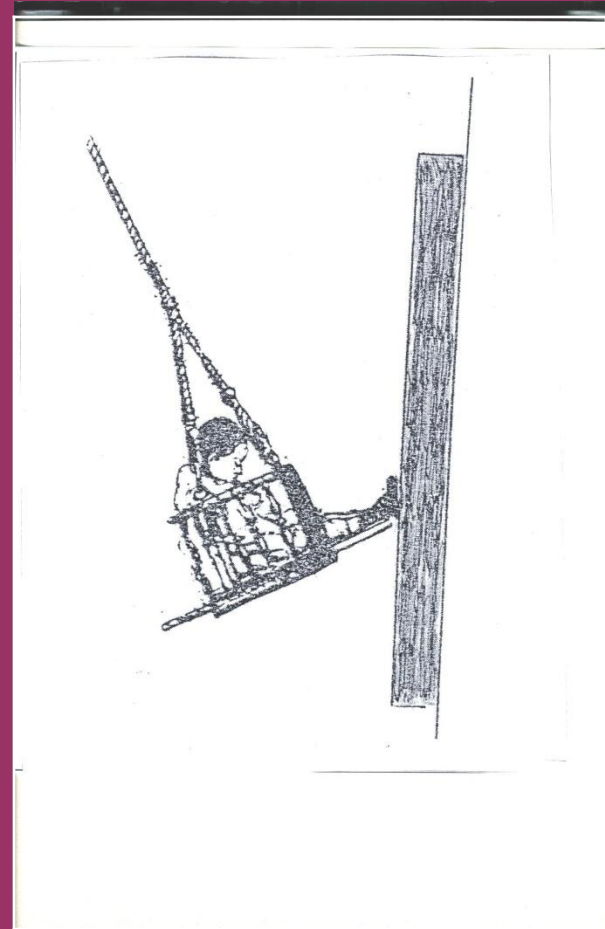
*Recherches cliniques et thérapeutiques sur  
l'épilepsie, l'hystérie et l'idiotie*

Detailed observations of cases

- Behaviour
  - Physiology
  - Post-mortem examination
  - Antecedents
- Concludes that heredity, not always the cause.

# Désiré-Magloire Bourneville (1840-1909)

- Continues work started by Séguin in France
- Treatment applied: education of
  - a) organic functions,
  - b) motor functions,
  - c) senses,
  - d) intellectual functions.



# Désiré-Magloire Bourneville (1840-1909)

- *Laïcisation* of hospitals and asylums
- Launch a reform of asylums (to build section adapted to education of children) → overcrowded section
- Launch school reforms to have structures adapted to handicapped children.

# Alfred Binet (1857-1911)

- Pioneer of standardized tests
  - Modular view of memories and the processes that underpin them
- Influence of the teachings of Charcot & Ribot acknowledged.

# Definitions of idiocy

	Brain	Faculties	Innateness	Heredity
<p><b><u>PRE-1830</u></b>            Pinel, Amard,            Dubuisson,            Fodéré,            Esquirol,            Belhomme, Foville</p>		+	(+)	(+)
<p><b><u>POST-1830</u></b>            Calmeil, Ferrus,            Voisin, Séguin,            Delasiauve, Marcé,            Bourneville</p>	+	+	+	+



# Conclusion

- Localizationist concepts on *organic basis of behaviour, division of faculties, heredity and innateness* → Impact of theories of development
  - Evolution → Localizationists → Developmentalists (innateness, heredity)
  - Developmentalists, trained by localizationists or localizationists themselves active in *medical, educational (& legal)* spheres
- Localizationist concepts contributed to changing childhood in the 19<sup>th</sup> century.