

The Rockefeller Institute for Medical Research

Bricks not white, nor red, nor yellow - nondescript;
In profile low, plain, austere - and functional.
Simple form, consistent with plain purpose.
Bare efficiency, dedicated to enquiry:
 Institute and man.
With blurred distinction, someone moved within;
Clothing impeccable but subdued;
Manner shy yet courteous;
Ochred with home -rolled smokes.
The Institute was set by Rockefeller;
 Who set Oswald Avery?
Unique provision for laboratories was laid;
Space and equipment far excelled all needs
For simple tests.
 And the man?
Mind, in excess of simple needs,
Reached through forbidding darkness.

* * * * *

Oswald Avery

(1877 - 1955)

He passed through time so quickly; he was already old,
 With more years yet to tread to end the patient work.
 His jutting brow was veined; his pate had now grown bald;
The man moved slowly, seeking always where could lurk
 That one swift cause of death - searching for some hidden mode.
 From patients, though a doctor, he now tried to shirk:
Bacteriology was his dedicated code
 For helping heal the sick. By him, pneumonia
 Was cultured in two forms: one small which smoothly flowed,
Yet killed so many it was viewed with chilling fear;
 The other, seeming roughly contoured to the eye,
 Would watch its virulence *in vivo* disappear
By painstaking dilutions. "Tell me how and why,"
 Pondered Avery with calm deliberation,
 "When given this harmless strain, healthy mice will die
From killed smooth cells in minute concentration?"
 Long, timeless days to sit or pace, and think or talk,
 With painful anxiousness for what direction,
From all those many byways down which he might walk,
 Would lead to gallant answers to this worthy quest.
 Long days in silence passed; then, like a plunging hawk,
He'd drop upon some reasoned method for the test;
 For thinking in itself is never just an end:
 Its value lies in what the well -trained mind can wrest
From keenest observations, which alone defend
 The mind from foolishness of unpricked, bubbling thought.
He kept his lab uncluttered, without trace or blend
Of homeliness: no pictures, relics, trash nor wart
 That might reveal some common human quality.
His bench lay bare, with plain test tubes in rows which caught

The Bunsen light, reflecting his humility.
 "The best planned methods all demand the simplest probe;
 Experimental clutter breeds banality!"
 With rigorous, honed intensity, his microbe
 Grew, cultured with a solitary obsession.
 He stayed behind at night, a scientific Job,
 Dedicated, gleaning facts by sharp selection.
 He boiled huge vats of beef hearts at blood heat for broth,
 Centrifuging them ice -cold with a fast motion,
 Washed and cooked in brine three times to form a froth,
 Then, shaken well with bile to break the cell walls down,
 Reprecipitated by an alcoholic trough;
 Digestive enzymes cleared away their sugary gown,
 And plain chloroform removed each trace of protein.
 The final fibrous strand brought Avery his crown:
 It was the purest DNA, which shone so clean;
 His many years of struggle proved its purity;
 Its transformation through the death of mice was seen,
 But many doubted its intrinsic verity.
 Though Avery found no protein in the slightest trace,
 Prejudiced adherents maintained their enmity,
 Denying him this hard-won, vital, central ace.
 Though many times he'd struggled as he sought the way -
 Carrying his candle in this remote, darkened place -
 In falling, he'd pick up a new-found piece of clay
 And fashion it to form some worth-while novel thought.
 This man, unaided, showed that simple DNA
 Contains the sum of all that life has ever wrought,
 Then died. "With greater honour would our wide world sway
 Had it honoured him, and its Nobel trinkets brought,"
 Spoke Chargaff, now ablaze with this inspiring ray.

(c) John Marr

References

Avery

Avery O, MacLeod C, and McCarty M. Induction of Transformation by a Desoxyribonucleic Acid Fraction Isolated from Pneumococcus Type III J. Exper. Med. (1944); 79:137-158. (Avery's classical paper describing the isolation of pure DNA from the pneumococcus, and his detailed proofs that this is the carrier of the genetic information.)

Dubos, Rene J. (1976) The Professor, The Institute and DNA [B.L.L.]

Biography of Avery, 1877-1955.

(p.8) Instructions to the architects [for Rockefeller Institute]: the buildings should be "as simple as consistent with present purpose".

(p.9) ...low profile and same uniformly prosaic institutional appeal. ...bricks that were neither red, nor white, nor yellow in color but nondescript. An austere functional simplicity that makes it remarkably inconspicuous. Visitors were impressed by the efficiency of the wards and diagnostic services, and diet kitchen, and especially by the importance of the laboratories, with space and equipment far in excess of the needs of mere routine examinations and tests. ...but...sturdy oak railings and broad marble steps.

(p.10) [Avery was] low key, like the buildings in which he worked...small, slender, slight, low voiced, mild mannered, shy, clothing impeccable but subdued. Charmingly courteous. [He was appointed] to study lobar pneumonia.

(p.11) ...for both Avery and the Institute, point of departure was awareness that the scientific basis of medicine was weak.

(p.17-18) ...with Pasteur, Koch and Lister,...proved that knowledge derived from laboratory results could be of practical usefulness. Scientific medicine was widely accepted by the general public as soon as it became prescriptive instead of descriptive.

(p.20) Frederick Taylor Gates, a Baptist minister, was advisor to Mr John D. Rockefeller in matters of philanthropy. He had read Osler's "Principles and Practice of Medicine", and wrote: "...each chapter on any particular disease would begin with a profound and learned discussion of the definition of the disease, of its extension throughout the world, of the history of discovery about it, of the revelations of innumerable postmortems, of the symptoms, cause and probable results of the disease, and the permanent complications and consequences likely to follow,...but when he comes to the vital part, namely treatment, ...invariably [unknown cause and no treatment.] All that could be done was nurse the patient and alleviate the suffering. [Only nature cured.] ...large number of infectious diseases caused by [microorganisms] - very few identified or isolated".

(p.42) [of Loeb] "not only is the mechanistic concept of life compatible with ethics, it seems the only conception of life which can lead us to an understanding of the source of ethics".

"...the only approach to medicine is through chemistry/physics".

"...Medical science? Dat iss a contradiction in terms. Der iss no You should begin with chemistry of proteins, as I do".

(p.47) Claude Bernard: "A great man is not great when he goes to bed, gets up, sneezes,... but only when he writes, thinks... and even then it is only those special occasions. It is in these moments that man is truly great, and that we can reach him through his work. We had better ignore the rest; it does not add anything to the man."

(p.70) not falsely efficient - never seen at his desk piled high with Petri dishes and bristling with test tubes like a forest where the trail ends and the searcher becomes lost in thicket of confined thought.

(p.71) whatever the importance or urgency of a problem, he never hurried, because he believed that worthwhile answers would come only from orderly thought. Old black patient: "What's your hurry, doc? ... You're passing more than you catch up with."

(p.78) Avery's lab was the smallest, neat and clean, as empty as possible, without photos, pictures, momentos, unused books etc. ...he had given up all aspects of his life for the sake of utter concentration on a few chosen goals. Before starting an experiment, he sat for days mulling it over with friends or alone. Among all that could be done, he was very anxious to determine by thought the one that appeared worth doing.

(p.79) He developed an uncanny sense for recognising what was truly important. Thinking was never an end in itself - he had no taste for concepts which did not lead to experimentation. "Ideas are wonderful things, but they don't work unless you work for them". He worked with enormous intensity. His obsession was to satisfy the most exacting experimental criteria. The work was not complete until all results could be brought together into a perfect 'protocol experiment'. The demonstration had to be so obvious that there was no need for statistical analysis. Then... visitors and colleagues were invited to admire the simplicity of the experimental set-up and the clarity of its results. It was high class showmanship, and had the quality of an artistic performance.

(p.80) Failure: "whenever you fall, pick up something". "Blowing bubbles is alright if you prick them yourself". [Wordsworth: Wisdom is often nearer when we stoop than when we soar]

(p.159) During the 1930s, Avery had been nominated for the Nobel Prize in recognition of his immunochemical studies. After the 1944 paper, the Nobel committee was immediately alerted to the fact that he had once more made a fundamental contribution to biological science... The Nobel committee, probably not accustomed to such self restraint and self-criticism, "found it desirable to wait until more became known about the mechanism involved..."

Judson, Horace Freeland (1978) *The Eighth Day of Creation* [574.880904]

(p.41) Avery was sixty-seven when the paper appeared; it was, Chargaff wrote in tribute, "the ever rarer instance of an old man making a great scientific discovery. It had not been his first. He was a quiet man; and it would have honoured the world more, had it honoured him more".

(p.626) Arne Tiselius, of the Nobel Foundation, was quoted as saying, "That Avery never received the prize is lamentable".