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COMMENTARY

Flexner's Words

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Abraham Flexner was a diligent, fearless man who spent 16 months in 98 cities evaluating medical schools: 174 inspections at 155 campuses. In April of 1909, he inspected 30 schools in 12 cities, mostly by train or horse and buggy [1]. As a preparatory schoolteacher from Louisville, KY, he was serendipitously chosen by Henry Prichett, the president of the Carnegie Foundation for the Advancement of Teaching, to survey all of the medical schools on the continent of North America. His 1910 scathing critique outlined recommendations for medical schools to enact higher standards. These included robust entrance requirements, better resource utilization, enhanced instructional delivery, and patient-centered care [2–4].

Initially perceived as muckracking, his genteel bombshell closed many diploma mill schools. From a high of 160 in 1900, there were 85 still standing in 1920. Flexner noted is his autobiography that "Such a rattling of dead bones has never been heard in this country before or since. Schools collapsed to the right and left, usually without a murmur" [5] . The purpose of this article is to review Mr. Flexner's beliefs and interventions on medical education in 1910 to elucidate why his perspective remains relevant in 2020.

Prior to being recruited by Prichett to conduct the survey, this unlikely candidate for leading medical education reform had never been inside a medical school [6]. His outsider status allowed him to approach the monumental task from a distance. Youngest of nine children born to a poor Jewish immigrant, Flexner followed his brother to Johns Hopkins but completed a degree in classics, not medicine [7]. As a Latin and Greek major at John Hopkins University, Flexner went on to obtain a degree in education [8].

Believing in the "ultimate importance of the kindergarten idea," Flexner opened his own preparatory school in Louisville, KY, with emphasis on educating the emotional as well as the scientific. At the age of 39, Flexner sold this school and jumped from Oxford to Cambridge to Berlin, practicing the lifelong learning he would advocate.

Flexner's self-described "unfettered lay mind" and focus on teaching allowed him to say what other reformers could or would not [2, 9]. But his was not a lay mind. Flexner had written much before the report, criticizing the American education system and lack of progressive style of learning. He did not care for the sharp distinctions between college, medical school, and graduate medical education. His unique and ground-breaking vision resulted in the revolution of effective medical training [10]. He criticized the lecture heavy instruction method and emphasized the importance of the humanistic aspects of medicine [4, 8]. While his impact is more evident in North America, his principles have been adapted internationally [11].

Flexner's report led to wide-ranging responses, from lawsuits and death threats to the redesign of medical schools (Vanderbilt University, Washington University, and University of Cincinnati) [4]. His insight predicted a model utilized by the current day Liaison Committee on Medical Education (LCME) (est. 1942), the accreditation body for medical schools in North America, on the assessment of the quality of education [12]. Flexner's vision for medical education would effectively transition students from passive listeners and memorizers into active participants [12]. In the process of matriculating and graduating physicians, he prioritized quality over quantity.

Within months of Abraham Flexner's report *Medical Education in the United States and Canada*, almost half of the medical schools in North America closed [13]. Prior to Flexner's inspections, medical schools had no prerequisite education, were generally for profit, had no required connection to universities, and usually included no hospital or lab work [13]. Into this climate of scholastic complacency and profiteering entered Flexner: "impatient, aggressively outspoken, and bitterly critical of colleagues" [1]. Henry James remarked of Flexner, "not one of our generation has rattled

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the bones in the academic closet so effectively" [6]. With actions both inflammatory and anti-establishment, how was Flexner able to make "the greatest single contribution" in the history of teaching medicine [6]?

The concrete recommendations in the eponymous report sound so elementary today that one may not appreciate their revolutionary nature. First, Flexner urged all medical schools to be linked to teaching hospitals with proper resources. Second, students would have to be highly qualified to enter. Third, unbiased research and laboratory investigation should be conducted in the schools and inform the education of students [1]. Prior to the report, for profit diploma mill medical schools, "essentially money making in spirit and object," had "educational quacks" graduating anyone "who had settled his tuition" [13].

Some criticize Flexner's emphasis on research, blaming him for the "publish or perish" contemporary environment in medical schools [14]. But Flexner framed research as directly related to patient care, enhancing formal analytic reasoning and informing education [15]. His motto was actually: "think much, publish little" [15]. It is also unfair to state that Flexner was solely concerned with the scientific aspect of medical education. Fifteen years after his report, he wrote: "Scientific medicine in America … is today sadly deficient in cultural and philosophical background" [15]. Flexner believed in the physician's social contract and duty to prevent disease, and ushered the medical student to the bedside: "The student is to collect and evaluate the facts, facts are locked up in the patient, to the patient, therefore he must go" [1, 7].

Flexner realized in 1910 that complete knowledge of medical minutae was no longer possible. He highlighted the need for educators with more breadth of knowledge, who could synthesize scientism and humanism [7, 16, 17].

"There is room for men of another type, the non-productive, assimilative teacher of wide learning, continuous receptivity, critical sense, responsive interest … catholic in their sympathies, scholarly in spirit and method, prove the purveyors and distributors through whom new ideas are harmonized and made current. They preserve balance and make connections" [18].

David Guest in 1991 first referred to "T-shaped" individuals. These professionals combine *depth* and problem-solving in one area of expertise with *breadth* and communication skills across many fields [17]. More than a century later, with the complexity of medicine and education, it is increasingly difficult to find renaissance men and women [19]. Flexner may have foreseen the molecular nature of research, leading to the divergence of researchers from clinicians and educators [15].

Flexner's unique nonmedical background provided a lens that dramatically shaped medical education. Perhaps medical educators need a reminder of the benefits of involving multiple perspectives to challenges we face in medical education and science. Diversification of viewpoints from a variety of disciplines and backgrounds may result in practical and innovative solutions.

A current focus in undergraduate medical education is the strategic development and integration of basic and clinical sciences throughout the program. Medical educators struggle in deciding where to place the large amount of content within each academic year (horizontal alignment) as well as throughout the program (vertical alignment) [20]. With too much information and not enough time, medical schools must decide what to leave out.

Unfortunately, basic sciences and clinical medicine crowd out the humanities. The patient's disease trumps the narrative. But medical decision-making is influenced more and more by nonmedical factors [17]. Instead of fostering ultraspecialization in medicine, Nicholas Donofrio argues that we should educate inquisitive, empathetic [T-shaped] caregivers who can use communication skills to reach insights between and beyond disciplines. Thus, Donofrio's quite Flexnerian assertion: "Population with a general education is better prepared to adapt to change and given greater freedom of choice in careers" [17].

With increasing clinical demands, documentation requirements, and the continuing expansion of medical knowledge, faculty find it more difficult to provide a capacious education to students and residents [21]. Patients want to be satisfied, administrators want revenue, and promotion committees want publications. In this atmosphere, medical schools benefit from nonphysician medical educators [21]. They share Flexner's freedom to place education above clinical concerns. Often overlooked, they tend to be jacks of all trades who come from diverse backgrounds [22]. The medical school deans who congregated at the Waldorf Astoria on May 19, 1956, recognized our most famous nonphysician educator by stating that "no other American of his generation has contributed more to the welfare of his country and to humanity in general" [6].

As we begin the 2020s, we will continue to modify our instructional delivery methods utilizing technology and focused independent student learning (e.g., flipped classrooms, problem-based learning). We will also transform how we delivery patient care (e.g., telemedicine), which will require new curricula to demonstrate how to provide care in a variety of settings. The unprecedented challenge of the current pandemic compels the entire world to overhaul all levels of education, with medical training uniquely impacted.

The decision-making by policymakers and university officials requires the medical education community to quickly adapt in delivering curricular and programmatic experiences to meet the needs of medical students while adhering to isolation guidelines. Medical stakeholders are changing curricular methods and policies, implementing new online electives, modifying patient care instruction with technology, and using creativity to conduct much needed research.

As we continue to transform medical education, we should remember Flexner's words and not lose sight of the quality of our programs. We must continue to teach and model compassionate, patient-centered care. We must continue to hold our students and faculty to high standards. While the path is constantly evolving, we must not forget the ultimate aim: developing knowledgeable, caring, and safe physicians.

Later in life Flexner brought together physicists, scholars, logicians, and mathematicians when he founded the Institute for Advanced Study (IAS). Harmonizing science and the humanities, the IAS was intended to be "a haven where scholars and scientists may regard the world and its phenomena as their laboratory without being carried off in the maelstrom of the immediate" [5]. Mr. Flexner used his depth in education and breadth in communication to make a massive impact on medical education. He not only contributed to and enhanced the education of thousands of physicians, but he prevented the mediocre education and unleashing on the public of many thousands of poorly trained doctors. His emphasis on the synergy of humanities and medicine, the art with the science, rings true as much today as it did a century ago. We must continually evaluate our priorities in instilling more than scientific knowledge into our students. We should reflect on our responsibility to shape well-rounded, compassionate, critical thinkers to safeguard the future of the medical profession.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval N/A

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