

MEDICAL EDUCATION IN THE UNITED STATES AND CANADA

A REPORT TO
THE CARNEGIE FOUNDATION
FOR THE ADVANCEMENT OF TEACHING

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WITH AN INTRODUCTION BY
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... the trustees of the Carnegie Foundation at their meeting in November, 1908, authorized a study and report upon the schools of medicine and law in the United States and appropriated the money necessary for this undertaking. The present report upon medical education, prepared, under the direction of the Foundation, by Mr. Abraham Flexner, is the first result of that action.

No effort has been spared to procure accurate and detailed information as to the facilities, resources, and methods of instruction of the medical schools. They have not only been separately visited, but every statement made in regard to each detail has been carefully checked with the data in possession of the American Medical Association, likewise obtained by personal inspection, and with the records of the Association of American Medical Colleges, so far as its membership extends. The details as stated go forth with the sanction of at least two, and frequently more, independent observers.

In making this study the schools of all medical sects have been included. It is clear that so long as a man is to practise medicine, the public is equally concerned in his right preparation for that profession, whatever he call himself,—allopath, homeopath, eclectic, osteopath, or whatnot. It is equally clear that he should be grounded in the fundamental sciences upon which medicine rests, whether he practises under one name or under another. ...

The report which follows is divided into two parts. In the first half the history of medical education in this country and its present status are set forth. The story is there told of the gradual development of the commercial medical school, distinctly an American product, of the modern movement for the transfer of medical education to university surroundings, and of the effort to procure stricter scrutiny of those seeking to enter the profession. The present status of medical education is then fully

described and a forecast of possible progress in the future is attempted. The second part of the report gives in detail a description of the schools in existence in each state of the Union and in each province of Canada.

It is the purpose of the Foundation to proceed at once with a similar study of medical education in Great Britain, Germany, and France, in order that those charged with the reconstruction of medical education in America may profit by the experience of other countries. ...

The significant facts revealed by this study are these:

(1) For twenty-five years past there has been an enormous over-production of uneducated and ill trained medical practitioners. This has been in absolute disregard of the public welfare and without any serious thought of the interests of the public. Taking the United States as a whole, physicians are four or five times as numerous in proportion to population as in older countries like Germany.

(2) Over-production of ill trained men is due in the main to the existence of a very large number of commercial schools, sustained in many cases by advertising methods through which a mass of unprepared youth is drawn out of industrial occupations into the study of medicine.

(3) Until recently the conduct of a medical school was a profitable business, for the methods of instruction were mainly didactic. As the need for laboratories has become more keenly felt, the expenses of an efficient medical school have been greatly increased. The inadequacy of many of these schools may be judged from the fact that nearly half of all our medical schools have incomes below \$10,000, and these incomes determine the quality of instruction that they can and do offer.

Colleges and universities have in large measure failed in the past twenty-five years to appreciate the great advance in medical education and the increased cost of teaching it along modern lines. Many universities desirous of apparent educational completeness have annexed medical schools without making themselves responsible either for the standards of the professional schools or for their support.

(4) The existence of many of these unnecessary and inadequate medical schools has been defended by the argument that a poor medical school is justified in the interest of the poor boy. It is clear that the poor boy has no right to go into any profession for which he is not willing to obtain adequate preparation; but the facts set forth in this report make it evident that this argument is insincere, and that the excuse which has hitherto been put forward in the name of the poor boy is in reality an argument in behalf of the poor medical school.

(5) A hospital under complete educational control is as necessary to a medical school as is a laboratory of chemistry or pathology. High grade teaching within a hospital introduces a most wholesome and beneficial influence into its routine. Trustees of hospitals, public and private, should therefore go to the limit of their authority in opening hospital wards to teaching, provided only that the universities secure sufficient funds on their side to employ as teachers men who are devoted to clinical science.

In view of these facts, progress for the future would seem to require a very much smaller number of medical schools, better equipped and better conducted than our schools now as a rule are; and the needs of the public would equally require that we have fewer physicians graduated each year, but that these should be better educated and better trained. With this idea accepted, it necessarily follows that the medical school will, if rightly conducted, articulate not only with the university, but with the general system of education. Just what form that articulation must take will vary in the immediate future in different parts of the country. Throughout the eastern and central states the movement under which the medical school articulates with the second year of the college has already gained such impetus that it can be regarded as practically accepted. In the southern states for the present it would seem that articulation with the four-year high school would be a reasonable starting-point for

the future. In time the development of secondary education in the south and the growth of the colleges will make it possible for southern medical schools to accept the two-year college basis of preparation. With reasonable prophecy the time is not far distant when, with fair respect for the interests of the public and the need for physicians, the articulation of the medical school with the university may be the same throughout the entire country. ...

The development which is here suggested for medical education is conditioned largely upon three factors: first, upon the creation of a public opinion which shall discriminate between the ill trained and the rightly trained physician, and which will also insist upon the enactment of such laws as will require all practitioners of medicine, whether they belong to one sect or another, to ground themselves in the fundamentals upon which medical science rests; secondly, upon the universities and their attitude towards medical standards and medical support; finally, upon the attitude of the members of the medical profession towards the standards of their own practice and upon their sense of honor with respect to their own profession.

These last two factors are moral rather than educational. They call for an educational patriotism on the part of the institutions of learning and a medical patriotism on the part of the physician. ...

HENRY S. PRITCHETT.

April 16, 1910.

HISTORICAL AND GENERAL

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Quite aside from the history, achievements, or present merits of any particular independent medical school, the creation of the type was the fertile source of unforeseen harm to medical education and to medical practice. Since that day medical colleges have multiplied without restraint, now by fission, now by sheer spontaneous generation. Between 1810 and 1840, twenty-six new medical schools sprang up; between 1840 and 1876, forty-seven more;¹ and the number actually surviving in 1876 has been since then much more than doubled. First and last, the United States and Canada have in little more than a century produced four hundred and fifty-seven medical schools, many, of course, short-lived, and perhaps fifty still-born.² One hundred and fifty-five survive to-day. ...

The problem is of course practical and not academic. Pending the homogeneous filling up of the whole country, inequalities must be tolerated. Man has been not inaptly differentiated as the animal with "the desire to take medicine."¹ When sick, he craves the comfort of the doctor,—any doctor rather than none at all, and in this he will not be denied. The question is, then, not merely to define the ideal training of the physician; it is just as much, at this particular juncture, to strike the solution that, economic and social factors being what they are, will distribute as widely as possible the best type of physician so distributable. Doubtless the chaos above characterized is in part accounted for by crude conditions that laughed at regular methods of procedure. But this stage of our national existence has gone by. What with widely ramifying railroad and trolley service, improving roads, automobiles, and rural telephones, we have measurably attained some of the practical consequences of homogeneity. The experience of older countries is therefore suggestive, even if not altogether conclusive.

Professor Paulsen, describing in his book on the *German Universities* the increased importance of the medical profession, reports with some astonishment that "the number of physicians has increased with great rapidity so that now there is, in Germany, one doctor for every 2000 souls, and in the large cities one for every 1000."¹

What would the amazed philosopher have said had he known that in the entire United States there is already on the average one doctor for every 568 persons, that in our large cities there is frequently one doctor for every 400² or less, that many small towns with less than 200 inhabitants each have two or three physicians apiece!³

Over-production is stamped on the face of these facts; and if, in its despite, there are localities without a physician, it is clear that even long-continued over-production of cheaply made doctors cannot force distribution beyond a well marked point. In our towns health is as good and physicians probably as alert as in Prussia; there is, then, no reason to fear an unheeded call or a too tardy response, if urban communities support one doctor for every 2000 inhabitants. On that showing, the towns have now four or more doctors for every one that they actually require,—something worse than waste, for the superfluous doctor is usually a poor doctor. So enormous an overcrowding with low-grade material both relatively and absolutely decreases the number of well trained men who can count on the profession for a livelihood. According to Gresham's law, which, as has been shrewdly remarked, is as valid in education as in finance, the inferior medium tends to displace the superior. If then, by having in cities one doctor for every 2000 persons, we got four times as good a doctor as now when we provide one doctor for every 500 or less, the apothecaries would find time hanging somewhat more heavily on their hands. Clearly, low standards and poor training are not now needed in order to supply physicians to the towns.

In the country the situation follows one of two types. Assuming that a thousand people in an accessible area will support a competent physician, one of two things will happen if the district contains many less. In a growing country, like Canada or our own middle west, the young graduate will not hesitate to pitch his tent in a sparsely settled neighborhood, if it promises a future. A high-grade and comparatively expensive education will not alter his inclination to do this. ...

In the case of stranded small groups in an unpromising environment the thing works out differently. A century of reckless over-production of cheap doctors has resulted in general overcrowding; but it has not forced doctors into these hopeless spots. It has simply huddled them thickly at points on the extreme margin. ...

... As a last resort, it might conceivably become the duty of the several states to salary district physicians in thinly settled or remote regions,—surely a sounder policy than the demoralization of the entire profession for the purpose of enticing ill trained men where they will not go.¹ We may safely conclude that our methods of carrying on medical education have resulted in enormous over-production at a low level, and that, whatever the justification in the past, the present situation in town and country alike can be more effectively met by a reduced output of well trained men than by further inflation with an inferior product.

The improvement of medical education cannot therefore be resisted on the ground that it will destroy schools and restrict output: that is precisely what is needed.

... In the year 1908, twelve states² showed a gain in population of 358,837. If now we allow in cities one additional physician for every increase of 2000, and outside cities an additional one for every increase of 1000 in population,—an ample allowance in any event,—we may in general figure on one more physician for every gain of 1500 in total population. We are not now arguing that a ratio of 1:1500 is correct; we are under no necessity of proving that. Our contention is simply that, starting with our present overcrowded condition, production henceforth at the ratio of one physician to every *increase* of 1500 in population will prevent a shortage, for the next generation at least. In 1908 the south, then, needed 240 more doctors to take care of its increase in population. In the course of the same year, it is estimated that 500 vacancies in the profession were due to death.¹ If every vacancy thus arising must be filled, conditions will never improve. Let us agree to work towards a more normal adjustment by filling two vacancies due to death with one new

physician,—once more, a decidedly liberal provision. This will prove sufficiently deliberate; it would have called for 250 more doctors by the close of the year. In all, 490 new men would have amply cared for the increase in population and the vacancies due to death. As a matter of fact, the southern medical schools turned out in that year 1144 doctors; 78 more southerners were graduated from the schools of Baltimore and Philadelphia. The grand total would probably reach 1300,—1300 southern doctors to compete in a field in which one-third of the number would find the making of a decent living already difficult. Clearly, the south has no cause to be apprehensive in consequence of a reduced output of higher quality.² Its requirements in the matter of a fresh supply are not such as to make it necessary to pitch their training excessively low.

The rest of the country may be rapidly surveyed from the same point of view. The total gain in population, outside the southern states already considered, was 975,008,—requiring on the basis of one more doctor for every 1500 more people, 650 doctors. By death, in the course of the year there were in the same area 1730 vacancies. Replacing two vacancies by one doctor, 865 men would have been required; in most sections public interest would be better cared for if they all remained unfilled for a decade to come. On the most liberal calculation, 1500 graduates would be called for, and 1000 would be better still. There were actually produced in that year, outside the south, 3497, *i.e.*, between two and three times as many as the country could possibly assimilate; and this goes on, and has been going on, every year.

It appears, then, that the country needs fewer and better doctors; and that the way to get them better is to produce fewer. To support all or most present schools at the higher level would be wasteful, even if it were not impracticable; for they cannot be manned. Some day, doubtless, posterity may reestablish a school in some place where a struggling enterprise ought now to be discontinued. Towards that remote contingency nothing will, however, be gained by prolonging the life of the existent institution. ...

With the over-production thus demonstrated, the commercial treatment of medical education is intimately connected. Low standards give the medical schools access to a large clientele open to successful exploitation by commercial methods. The crude boy or the jaded clerk who goes into medicine at this level has not been moved by a significant prompting from within; nor has he as a rule shown any forethought in the matter of making himself ready. He is more likely to have been caught drifting at a vacant moment by an alluring advertisement or announcement, quite commonly an exaggeration, not infrequently an outright misrepresentation. Indeed, the advertising methods of the commercially successful schools are amazing.¹ Not infrequently advertising costs more than laboratories. The school catalogues abound in exaggeration, misstatement, and half-truths.³ The deans of these institutions occasionally know more about modern advertising than about modern medical teaching. ...

THE ACTUAL BASIS OF MEDICAL EDUCATION

TAKING a two-year college course, largely constituted of the sciences, as the normal point of departure, let us now survey the existing status. The one hundred and fifty-five medical schools of the United States and Canada fall readily into three divisions: the first includes those that require two or more years of college work for entrance; the second, those that demand actual graduation from a four-year high school or oscillate about its supposed "equivalent;" the third, those that ask little or nothing more than the rudiments or the recollection of a common school education. ...

To get at the real admission standard, then, of these medical schools, one must make straight for the "equivalent." On the methods of ascertaining and enforcing that, the issue hangs. Now the "equivalent" may be defined as a device that concedes the necessity of a standard which it forthwith proceeds to evade. The professed high school basis is variously sacrificed to this so-called "equivalent." The

medical schools under discussion agree to accept at face value only graduation diplomas² from "approved" or "accredited" high schools. ...

If the standard were enforced, the candidates in question, not offering a graduation diploma from an accredited high school, would be compelled to enter by written examination. But the examination is, as things stand, only another method of evasion. Neither in extent nor in difficulty do the written examinations, in the relatively rare cases in which they are given, even approximate the high school standard. Nor are they meant to do so. Colleges with medical departments of the kind under discussion do not expect academic and medical students to pass the same or the same kind of examination: a special set of questions is prepared for the medical candidates, including perhaps half the subjects, and each of these traversing about half the ground covered by the academic papers. ...

RECONSTRUCTION

THE necessity of a reconstruction that will at once reduce the number and improve the output of medical schools may now be taken as demonstrated. A considerable sloughing off has already occurred. It would have gone further but for the action of colleges and universities which have by affiliation obstructed nature's own effort at readjustment. Affiliation is now in the air. Medical schools that have either ceased to prosper, or that have become sensitive to the imputation of proprietary status or commercial motive, seek to secure their future or to escape their past by contracting an academic alliance. The present chapter undertakes to work out a schematic reconstruction which may suggest a feasible course for the future. ...

This solution deals only with the present and the near future,—a generation, at most. In the course of the next thirty years needs will develop of which we here take no account. As we cannot foretell them, we shall not endeavor to meet them. Certain it is that they will be most effectively handled if they crop up freely in an unencumbered field. It is therefore highly undesirable that superfluous schools now existing should be perpetuated in order that a subsequent generation may find a means of producing its doctors provided in advance. The cost of prolonging life through this intervening period will be worse than wasted; and an adequate provision at that moment will be embarrassed by inheritance and tradition. Let the new foundations of that distant epoch enjoy the advantage of the Johns Hopkins, starting without handicap at the level of the best knowledge of its day.

The principles upon which reconstruction would proceed have been established in the course of this report: (1) a medical school is properly a university department; it is most favorably located in a large city, where the problem of procuring clinical material, at once abundant and various, practically solves itself. Hence those universities that have been located in cities can most advantageously develop medical schools. (2) Unfortunately, however, our universities have not always been so placed. They began in many instances as colleges or something less. Here a supposed solicitude for youth suggested an out-of-the-way location; elsewhere political bargaining brought about the same result. The state universities of the south and west, most likely to enjoy sufficient incomes, are often unfortunately located: witness the University of Alabama at Tuscaloosa, of Georgia at Athens, of Mississippi at Oxford, of Missouri at Columbia, of Arkansas at Fayetteville, of Kansas at Lawrence, of South Dakota at Vermilion; and that experience has taught us nothing is proved by the recent location of the State University of Oklahoma at Norman. Some of these institutions are freed from the necessity of undertaking to teach medicine by an endowed institution better situated; in other sections the only universities fitted by their large support and their assured scientific ideals to maintain schools of medicine are handi-

capped by inferiority of location. We are not thereby justified in surrendering the university principle. Experience, our own or that of Germany, proves, as we have already pointed out, that the difficulty is not insuperable. At relatively greater expense, it is still feasible to develop a medical school in such an environment: there is no magnet like reputation; nothing travels faster than the fame of a great healer; distance is an obstacle readily overcome by those who seek health. The poor as well as the rich find their way to shrines and healing springs. The faculty of medicine in these schools may even turn the defect of situation to good account; for, freed from distraction, the medical schools at Iowa City and Ann Arbor may the more readily cultivate clinical science. An alternative may indeed be tried in the shape of a remote department. The problem in that case is to make university control real, to impregnate the distant school with genuine university spirit. The difficulty of the task may well deter those whose resources are scanty or who are under no necessity of engaging in medical teaching. As we need many universities and but few medical schools, a long-distance connection is justified only where there is no local university qualified to assume responsibility. A third solution—division—may, if the position taken in previous chapters is sound, be disregarded in the final disposition.¹

(3) We shall assign only one school to a single town. As a matter of fact, no American city now contains more than one well supported university,²—and if we find it unnecessary or impolitic to duplicate local university plants, it is still less necessary to duplicate medical schools. The needless expense, the inevitable shrinkage of the student body, the difficulty of recruiting more than one faculty, the disturbance due to competition for hospital services, argue against local duplication. It is sometimes contended that competition is stimulating: Tufts claims to have waked up Harvard; the second Little Rock school did undoubtedly move the first to spend several hundred dollars on desks and apparatus. But competition may also be demoralizing; the necessity of finding students constitutes medical schools which ought to elevate standards the main obstacles to their elevation: witness the attitude of several institutions in Boston, New York, Philadelphia, Baltimore, and Chicago. Moreover, local competition is a stimulus far inferior to the general scientific competition to which all well equipped, well conducted, and rightly inspired university departments throughout the civilized world are parties. The English have experimented with both forms,—a single school in the large provincial towns, a dozen or more in London,—and their experience inclines them to reduce as far as possible the number of the London schools. Amalgamation has already taken place in certain American towns: the several schools of Cincinnati, of Indianapolis, and of Louisville have all recently “merged.” This step is easy enough in towns where there is either no university or only one university. Where there are several, as in Chicago, Boston, and New York, the problem is more difficult. Approached in a broad spirit it may, however, prove not insoluble; coöperation may be arranged where several institutions all possess substantial resources; universities of limited means can retire without loss of prestige,—on the contrary, the respect in which they are held must be heightened by any action dictated by conscientious refusal to continue a work that they are in no position to do well.

(4) A reconstruction of medical education cannot ignore the patent fact that students tend to study medicine in their own states, certainly in their own sections. In general, therefore, arrangements ought to be made, as far as conditions heretofore mentioned permit, to provide the requisite facilities within each of the characteristic state groups. There is the added advantage that local conditions are thus heeded and that the general profession is at a variety of points penetrated by educative influences. New Orleans, for example, would cultivate tropical medicine; Pittsburgh, the occupational diseases common in its environment. In respect to output, we may once more fairly take existing conditions into account. We are not called on to provide schools enough to keep up the present ratio. As we should in any case

hardly be embarrassed for almost a generation in the matter of supply, we shall do well to produce no doctors who do not represent an improvement upon the present average.

The principles above stated have been entirely disregarded in America. Medical schools have been established regardless of need, regardless of the proximity of competent universities, regardless of favoring local conditions. An expression of surprise at finding an irrelevant and superfluous school usually elicits the reply that the town, being a "gateway" or a "center," must of course harbor a "medical college." It is not always easy to distinguish "gateway" and "center:" a center appears to be a town possessing, or within easy reach of, say 50,000 persons; a gateway is a town with at least two railway stations. The same place may be both,—in which event the argument is presumably irrefragable. Augusta, Georgia, Charlotte, North Carolina, and Topeka, Kansas, are "centers," and as such are logical abodes of medical instruction. Little Rock, St. Joseph, Memphis, Toledo, Buffalo, are "gateways." The argument, so dear to local pride, can best be refuted by being pursued to its logical conclusion. For there are still forty-eight towns in the United States with over 50,000 population each, and no medical schools: we are threatened with forty-eight new schools at once, if the contention is correct. The truth is that the fundamental, though of course not sole, consideration is the university, provided its resources are adequate; and we have fortunately enough strong universities, properly distributed, to satisfy every present need without serious sacrifice of sound principle. The German Empire contains eighty-four cities whose population exceeds 50,000 each. Of its twenty-two medical schools, only eleven are to be found in them: that is, it possesses seventy-three gateways and centers without universities or medical schools. The remaining eleven schools are located in towns of less than 50,000 inhabitants, a university town of 30,000 being a fitter abode for medical study than a non-university town of half a million, in the judgment of those who have best succeeded with it.

That the existing system came about without reference to what the country needed or what was best for it may be easily demonstrated. Between 1904 and 1909 the country gained certainly upwards of 5,000,000 in population; during the same period the number of medical students actually decreased from 28,142 to 22,145, *i.e.*, over 20 per cent. The average annual production of doctors from 1900 to 1909 was 5222; but last June the number dropped to 4442. Finally, the total number of medical colleges which reached its maximum—166¹— in 1904 has in the five years since decreased about 10 per cent. Our problem is to calculate how far tendencies already observable may be carried without harm.

We have calculated that the south requires for the next generation 490 new doctors annually, the rest of the country, 1500. We must then provide machinery for the training of about 2000 graduates in medicine yearly. Reckoning fatalities of all kinds at ten per cent per annum, graduating classes of 2000 imply approximately junior classes of 2200, sophomore classes of 2440, freshman classes aggregating 2700,—something over 9000 students of medicine. Thirty medical schools, with an average enrolment of 300 and average graduation classes of less than 70, will be easily equal to the task. As many of these could double both enrolment and output without danger, a provision planned to meet present needs is equally sufficient for our growth for years to come. It will be time to devise more schools when the productive limit of those now suggested shall come in sight.

For the purpose here in mind, the country may be conceived as divided into several sections, within each of which, with due regard to what it now contains, medical schools enough to satisfy its needs must be provided.² Pending the fuller development of the states west of the Mississippi, the section east will have to relieve them of part of their responsibility. The provisional nature of our suggestions is thus

obvious; for as the west increases in population, as its universities grow in number and strength, the balance will right itself: additional schools will be created in the west and south rather than in the north and east. It would of course be unfortunate to over-emphasize the importance of state lines. We shall do well to take advantage of every unmistakably favorable opportunity so long as we keep within the public need; and to encourage the freest possible circulation of students throughout the entire country. ...

In so far as the United States is concerned, the foregoing sketch calls for 31 medical schools¹ with a present annual output of about 2000 physicians, *i. e.*, an average graduating class of about 70 each. They are capable of producing 3500. All are university departments, busy in advancing knowledge as well as in training doctors. Nineteen are situated in large cities with the universities of which they are organic parts; four are in small towns with their universities; eight are located in large towns always close by the parent institutions. Divided and far distant departments are altogether avoided. ...

Reduction of our 155 medical schools to 31 would deprive of a medical school no section that is now capable of maintaining one. It would threaten no scarcity of physicians until the country's development actually required more than 3500 physicians annually, that is to say, for a generation or two, at least. Meanwhile, the outline proposed involves no artificial standardization: it concedes a different standard to the south as long as local needs require; it concedes the small town university type where it is clearly of advantage to adhere to it; it varies the general ratio in thinly settled regions; and, finally, it provides a system capable without overstraining of producing twice as many doctors as we suppose the country now to need. In other words, we may be wholly mistaken in our figures without in the least impairing the feasibility of the kind of renovation that has been outlined; and every institution arranged for can be expected to make some useful contribution to knowledge and progress.

The right of the state to deal with the entire subject in its own interest can assuredly not be gainsaid. The physician is a social instrument. If there were no disease, there would be no doctors. And as disease has consequences that immediately go beyond the individual specifically affected, society is bound to protect itself against unnecessary spread of loss or danger. It matters not that the making of doctors has been to some extent left to private institutions. The state already makes certain regulations; it can by the same right make others. Practically the medical school is a public service corporation. It is chartered by the state; it utilizes public hospitals on the ground of the social nature of its service. The medical school cannot then escape social criticism and regulation. It was left to itself while society knew no better. But civilization consists in the legal registration of gains won by science and experience; and science and experience have together established the terms upon which medicine can be most useful. ...

Society forbids a company of physicians to pour out upon the community a horde of ill trained physicians. Their liberty is indeed clipped. As a result, however, more competent doctors being trained under the auspices of the state itself, the public health is improved; the physical well-being of the wage-worker is heightened; and a restriction put upon the liberty, so-called, of a dozen doctors increases the effectual liberty of all other citizens. Has democracy, then, really suffered a set-back? Reorganization along rational lines involves the strengthening, not the weakening, of democratic principle, because it tends to provide the conditions upon which well-being and effectual liberty depend.

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