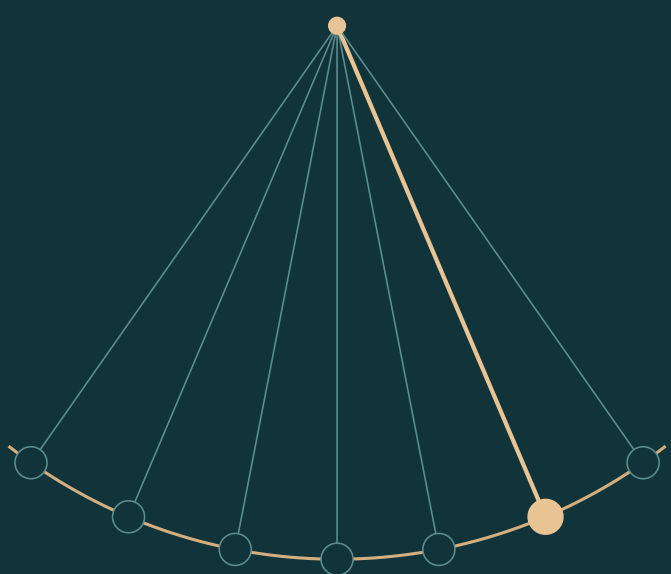
PEYMAN BAKHSHAYESH

MD, PhD, MBA

The Future of Education in Iran

Schools, universities and the freedom to ask



NOVEMBER 2026

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PREFACE

What we owe the next pupil

A girl in Abadan looks up at the stars and asks her teacher how anyone knows the universe is expanding. What answer does Iran owe her? I should like her teacher to take the question seriously, find two galaxy spectra and show her where to begin. She may have asked out of curiosity, or because something she read troubles her. The teacher has no need to enquire into the beliefs of her family. The question is hers. The universe belongs to her as much as it belongs to a child in Stockholm or Leeds.

I was a child in Abadan when the revolution of 1979 changed the country in which I was growing up. Forty-seven years later, my objection to the Islamic Republic's direction of education begins with the use it has made of childhood. A state took upon itself the right to decide what kind of person an Iranian child should become. Within two years of the revolution, the authorities had rewritten textbooks in subjects including social studies and religion. Decades later, the state's own 2011 education reform document explicitly tied schooling to the ideals of the Islamic Revolution. That ambition runs from the first textbook to the university appointment. Iranian teachers, scientists and students have achieved a great deal under those conditions. Imagine what they could do with the same talents and the freedom to choose their questions. [1, 2]

As a trauma surgeon and a teacher, I rely on the colleague who sees something I have missed and has the confidence to say so. I want that independence to be cultivated much earlier in life. In *Nation Building* I argued that equal citizenship has to be felt in such ordinary things as obtaining a school place or receiving a fair hearing. Here I want to follow the pupil through the school gate. What can she learn? Who has the power to stop her? Who will pay for her books? What happens the first time she tells a respected adult that she thinks he is wrong? [3]

CHAPTER ONE

The philosophy of science

How do we know?

Put a weight on a length of string and let it swing. Ask the class what would happen to the time of a swing if the weight were heavier. An answer given with great conviction may be entirely reasonable to the child who gives it. Our experience of carrying a full bucket is different from our experience of carrying an empty one. That experience has supplied an intuition. The interesting moment comes when the class agrees how to put it to the test.

Keep the length of the string and the small angle of release the same. Change the weight. Time ten swings together to make the error from starting the watch less important. Let a second group try, then change the length while keeping the weight the same. At small angles a simple pendulum's period depends principally on its length and the local strength of gravity. If two groups get slightly different times, put both on the board. A pupil who asks whether they measured the length to the centre of the weight has understood something more valuable than the formula alone.

Philosophers have spent centuries examining the steps concealed in that small experiment. Francis Bacon directed attention to organised observation. David Hume asked what entitles us to expect the next case to resemble the ones we have seen. Karl Popper asked what finding could count against a proposed explanation. Thomas Kuhn examined how a scientific community learns to see a problem through a shared framework, and how that framework can change. Teach these questions alongside the experiment. A pupil can then tell the difference between what she saw, what she inferred and what she still needs to find out. [4]

CHAPTER ONE / THE PHILOSOPHY OF SCIENCE

A history written in matter

Follow a single question across the sciences. Where did the oxygen in the glass of water on a pupil's desk come from? Chemistry tells us how oxygen combines with hydrogen. Physics takes us further back. Much of the hydrogen in the universe dates to its hot early history. Oxygen formed later inside stars and entered the material from which later generations of stars and planets formed. A good textbook should let a young Iranian follow that journey as far as the evidence will take him. For some pupils it will be the first time the periodic table feels like a history they belong to. [5, 6]

In upper secondary school I would put a laboratory spectrum beside the spectrum of a distant galaxy. Identify the pattern of lines, then look for the shift in their wavelengths. Compare many galaxies and bring in the independent evidence supplied by the cosmic microwave background. The Big Bang model describes a universe that was hotter and denser in the past and has expanded. A pupil can ask what happened at the very beginning. A teacher who explains where our present observations run out has given an honest answer and left a real problem for the next generation. [5]

Biological evolution asks a different historical question. How did populations of living things change, and what is the evidence that different species have common ancestors? A class can compare the bones of a human hand with those of a bat's wing, then ask whether fossil sequences and comparisons of DNA tell a consistent story. In my own profession we spend years learning the names of bones. There is pleasure in discovering why a wing and a hand should have so much anatomy in common. Every student should have access to that explanation and to the evidence on which it rests. [7]

A philosophy class can then take up materialism itself. Is everything that exists physical? Why do some thinkers say yes, and what objections have others raised? A state that fears the question of creation deprives pupils twice over. They miss the science of how matter and life have changed and the philosophical argument about what those discoveries mean.

CHAPTER ONE / THE PHILOSOPHY OF SCIENCE

When a scientific paper reaches the classroom

Give medical students two papers about the same fracture. One surgeon reports excellent results with a particular operation. Another team treats a similar group and gets a less encouraging result. Before the students take sides, I would ask who was offered each operation. Were the fractures equally severe? How was recovery measured? Could the patients who did badly have been the ones who never came back for review? The answer changes what we can responsibly tell the next patient. The same habit matters to an engineer reading a test report on concrete or a council comparing two ways of supplying clean water.

An idea becomes available for scientific criticism when its author sets down the question, the method, the observations and the reasoning. Peer reviewers may detect a weakness before publication. Readers may find another afterwards. Reproducibility can mean that somebody who uses the same data and analytical steps obtains the same result. Replication asks whether new observations support a consistent finding. Astronomy has no second early universe on which to rerun the experiment. It has independent measurements, instruments and predictions that can expose a mistaken account of this one. [8]

Scientific claims travel because people elsewhere can check their reasoning and the conditions under which they hold. A bridge built in Khuzestan will meet temperatures and soils different from a bridge in Sweden. The mechanics travel. The engineer still needs the local measurements. This is what I mean by universal standards. An Iranian researcher should be able to challenge a professor at a famous foreign university on the strength of a better measurement. I want our universities to welcome the same challenge when it comes from one of their own students.

CHAPTER ONE / THE PHILOSOPHY OF SCIENCE

From the first schoolbook to the research laboratory

In primary school I would give a child a notebook in which a question receives as much space as its answer. Draw the shadow of a stick in the morning and again after lunch. Write the date and mark where the stick stood. In the middle years, return to the same observation in another season. Introduce a ruler, plot the measurements and discuss what was kept constant. By upper secondary school the pupils can use a model of the Earth and the Sun to explain their earlier drawings. A worn notebook can show a family what several years of science teaching have accomplished.

At university the freedom to choose a problem carries a new responsibility. A dissertation should show why the question matters, what other people have found and what would count as a fair test. I would give credit to a carefully conducted study whose result disappoints its author. A department that rewards only striking conclusions teaches its young researchers to hide the most instructive part of their work. Libraries should preserve dissertations, corrections and, where consent and confidentiality allow, the data and methods that give a thesis its value.

I believe too many of our universities fall short of what their own students could achieve. They should measure themselves against the best departments in their field. Start with concrete questions. Can students obtain the papers their lecturer cites? Do outside scholars use their work? Can a junior researcher publish an inconvenient finding and keep her post? An internet connection makes it possible to join an international seminar from a provincial campus. A library subscription, time to prepare and a supervisor willing to let the student speak turn that possibility into an education.

CHAPTER TWO

The politics of education

What a constitution should do for a pupil

I support constitutional monarchy and see Crown Prince Reza Pahlavi as a figure around whom many Iranians can cooperate in a transition. Other Iranians will argue for a constitutional republic. I want the young republican to have precisely the liberty to make her case that I claim for myself. The future form of the state belongs to the Iranian electorate. Whichever choice prevails, a minister should have no authority to make assent to a religious or political proposition a condition of graduation. That is one practical meaning of the political pluralism I set out in *Nation Building*. [3]

A future constitution should protect freedom of thought, speech, expression and conscience in education. Write the guarantee in language a family can use. A school applicant may decline to declare a faith. A teacher may discuss an unpopular historical interpretation. A university society may invite a critic of the government. Admissions, employment and research decisions must have stated academic or professional grounds. Give the person affected written reasons, a time in which to appeal, and an independent body with power to put the decision right. These protections would give force in Iran to freedoms also recognised in international human-rights and higher-education standards. [9, 10]

Consider a pupil refused admission who suspects that her family's religion counted against her. Publishing an admissions policy is a start. Give her access to the criteria actually applied to her application. Let an independent reviewer examine comparable decisions while protecting other children's identities. If the exclusion was improper, offer her a place in time to join her classmates. A remedy that arrives after her school years have passed will have cost the institution less than it cost the child.

CHAPTER TWO / THE POLITICS OF EDUCATION

Who writes the textbook?

In 1979 the political order changed quickly. A textbook can outlast the minister who ordered it, and the questions set in a national examination can outlast a textbook. If the examination still rewards a prescribed declaration of belief, teachers who want their pupils to succeed will keep rehearsing it. Reform therefore has to reach the examiner's desk. In a history paper, marks should reflect the quality of the evidence, the pupil's use of sources and the coherence of the argument. Publish sample answers that reach different conclusions and earn equally high marks.

I would ask practising teachers, subject specialists, parents and students to take part in an open curriculum review. Make the draft, the names and declared interests of the reviewers, and the reasons for major revisions public. Invite comments from across the provinces. Where experts disagree, publish the disputed passages with their explanations. Agree national entitlements in literacy, mathematics, science, history, the arts and civic education. Allow more than one textbook to meet them. A teacher in a Caspian town may teach a principle through fisheries that a teacher in Yazd teaches through water storage.

Religion has a place as a subject of historical, literary and philosophical enquiry. So does the history of unbelief. Pupils should be able to compare views of creation, ask what different traditions mean by a good life, and examine the political uses of religious authority. In biology the syllabus should teach evolution to the standard established by biological evidence. A pupil can study both subjects without giving a public account of her private convictions. Teachers too must be free to believe, change their minds, or keep their beliefs to themselves.

CHAPTER TWO / THE POLITICS OF EDUCATION

Learning to disagree in public

Imagine a secondary-school council with a modest sum to spend. One group wants library hours extended. Another wants the school bus to make an extra stop so pupils who live farther away can stay for after-school activities. Both groups have a case. The pupils must obtain costs, listen to the people affected, publish their reasons, vote and return a term later to see who benefited. Losing the vote need not end anyone's participation. The minority can ask for the figures and argue again next term. A pupil who experiences that process knows something about parliamentary life that a definition in a civics book cannot convey.

The same school can invite a trade unionist, a business owner, a women's rights advocate and a municipal engineer to discuss employment and transport. Give women working for equal opportunity, workers negotiating conditions and advocates for children's rights the chance to present their own arguments. Let students ask who would pay for each proposal and who might be left out. Views from the political left and right should be heard in their strongest form. The mark belongs to the student who understands and examines an argument, including an argument he opposes.

There is room here for the study of Iran's own history. Let pupils examine records of the expansion of women's education during the Pahlavi period, hear the experiences of different generations and consider who gained access when. Place evidence from provincial towns alongside that from Tehran. A student may come to admire a reform her grandfather distrusted. She may also discover that an institution he admired failed somebody else's family. Our country can bear both discoveries. The common ground is our willingness to examine them together. [11]

CHAPTER TWO / THE POLITICS OF EDUCATION

Academic freedom after the transition

On the first morning after a political transition, children will still need a school to attend and teachers will still need to know whether they will be paid. Keep classes open wherever it is safe, secure school records and announce how examinations and qualifications will be honoured. End tests of ideological loyalty. Give students and teachers previously excluded on those grounds a route to review. A person accused of a specific act of misconduct deserves evidence and a fair hearing. A new administration can dispense with political vetting from the day it takes office.

At university, publish the criteria for appointments and promotion. Have subject peers assess the work and record conflicts of interest. Students and staff should elect representatives who can question the governing body about an appointment or a cancelled lecture. Parliament can require a university that receives public money to account for it. A minister who dislikes the result of a research project must have as much right to criticise it as any citizen, and as little right to dismiss its author for the conclusion. [10]

In *Mismanagement* I asked what happens to a country when officials escape the consequences of bad decisions. Apply the question to education. If a ministry announces that every secondary school has a laboratory, a teacher must be free to say that the room in her school is locked because the technician's post remains vacant. Publish the response, who is responsible and when the room opens. A political system begins earning the confidence of its teachers when one of them can report an awkward fact and see something done about it. [12]

CHAPTER THREE

The economics of education

What free education costs a family

Ask a parent what a free school costs. She may tell you about the bus fare, the workbook, the internet connection and the wages her eldest daughter gives up when she stays in education. Another parent may be able to pay for all those things but have no way of getting a son who uses a wheelchair through the school entrance. A government can abolish a fee with one signature. It takes more care to find out whether the child has reached the classroom.

My starting point is universal, tuition-free public education through the end of secondary school, with core books and learning materials provided. Beyond that, public universities and technical colleges should offer a tuition-free route for the majority, with maintenance grants for people whose means would otherwise keep them out. Include adults returning after years of work or care and students previously excluded. Publish the eligibility rules before applications open. A grant that arrives halfway through the year cannot pay the rent that fell due in September.

Start the budget with the number of pupils, then ask what it costs to teach them where they live. A sparsely populated district may need a bus and a teacher for a small class. A large urban school may need additional staff for pupils learning in a second language. Provide a basic allocation for every pupil and supplements for disadvantage, disability and distance. Publish what each district was due, what it received and what families still paid. When attendance falls, speak to the families who left. The explanation may be the price of a journey that never appears in the education accounts.

CHAPTER THREE / THE ECONOMICS OF EDUCATION

A library that reaches the village

Free access to the world's knowledge needs a public institution willing to do some unglamorous work. Someone has to select the books, pay translators, negotiate licences, correct errors and make the catalogue usable on a slow connection. I would begin with a national collection of open textbooks, commissioned under licences that permit copying, translation and adaptation. Make the same edition available to read on a telephone, download for offline use, print affordably, or hear through a screen reader. Put a date, an author and a correction address on every edition. UNESCO's work on open educational resources gives us a practical starting point. [13]

Persian should be a language in which a pupil can learn modern physics from the beginning. Let a village teacher explain a difficult idea in the language her pupils use at home and give them the Persian and international scientific terms alongside it. A university student should also have access to the original paper, whether it was written in English or another language. A network of translators, librarians and subject specialists could maintain a public glossary showing how a term is used, who reviewed it and where it differs between disciplines.

Publicly funded research should be deposited where the public can read it, using lawful open copies and accessible summaries. Negotiate shared access to works that remain under subscription. A provincial college should be able to request a paper through the same national library network as a university in Tehran. In my essay *Ideology of Contraction or Culture of Expansion* I explored what it means to reopen a society to the movement of people and ideas. A librarian in Iran who can find, translate and send a requested paper to a teacher by the end of the week gives that idea a human scale. [14]

CHAPTER THREE / THE ECONOMICS OF EDUCATION

Why innovation belongs in a technical college

Schumpeter's idea of creative destruction interests me because it describes how a new product, process or organisation can displace one that has ceased to serve people well. In my earlier essay on reconstruction, I distinguished the act of rebuilding what has been lost from the harder achievement of making something work better than it did before. In education, I see immense scope for rapid progress. Iran has experienced teachers, skilled tradespeople, graduates hungry for discovery and a diaspora with access to laboratories and industry. The question is how to bring these people together around work that somebody needs done. [15, 18]

Take a pump used to irrigate a farm. A technical college could invite farmers and repair technicians to identify why a particular model fails. Engineering students might measure the problem and try a repair that can be made locally. An economics class could calculate the lifetime cost, including energy use and days out of service. Farmers could test the proposed change and publish the faults they still find. An apprentice who devises the most reliable repair deserves public credit alongside the lecturer who helped measure it. If a local firm can manufacture the part and other farms choose to buy it, the pupils have seen innovation enter the economy.

Make apprenticeships paid, with named supervisors, assessed skills and qualifications that travel between provinces. Give a young technician a route into an engineering degree later and a university student a route into skilled practice. A family should be able to look at either path and see prospects of a decent living. I would judge progress by what graduates can do, whom employers can now recruit locally and which problems communities can finally afford to solve.

CHAPTER THREE / THE ECONOMICS OF EDUCATION

Who pays for a difficult question?

An elected government can reasonably say that water, energy, housing, transport and health are national research priorities. Publish those priorities and allocate part of the research budget to them. Set aside a separate stream in which researchers propose their own questions, including questions with no obvious commercial return. Today's minister cannot identify every discovery that tomorrow’s country will need. I would want a historian studying a provincial archive and a physicist working on a basic measurement to be able to make an honest case for public support.

For both streams, appoint panels with relevant expertise, disclose conflicts of interest and publish how decisions are made. Give a young team funds to test a promising idea before requiring it to compete with an established laboratory for a large grant. Allow researchers abroad to co-supervise work under agreements that give Iranian colleagues proper credit, access to the data and authority over the research. Reserve part of each grant for maintenance, staff and training. An imported instrument becomes an expensive piece of furniture the day a small component breaks and nobody has the manual.

There will be choices. If a university can afford a new instrument at the capital campus or enough technician time to open three existing laboratories for longer, ask both groups which experiments their students could actually complete. Publish the cost over the life of each option and explain the decision. A year later, count the students who used the equipment, the work completed and any results made public. That scrutiny is one way of protecting adventurous research. Citizens can see what was attempted, what was learnt and why an honest failure may have been worth their money.

CHAPTER FOUR

The psychology of education

What silence can mean

A pupil hears an account of human origins that differs from what adults have taught him. Before he can decide what he thinks about the evidence, he may have another decision to make. Will asking the question be taken as an insult to his father? Will the teacher take it personally? Could it follow him into an examination or a reference? Those are sensible calculations in an institution where intellectual disagreement has carried a personal cost. Removing a passage from a textbook is comparatively easy. Earning that pupil's trust may take a school several years.

In my essay on fear, courage and hope, I argued that silence under pressure is a poor guide to what people believe, and that hope grows when people can see a way to act. Apply that observation to a classroom. The quiet child may have understood perfectly and decided that silence serves him best. Give him more than one way to take part. Let him submit a question in writing, compare answers with a partner or speak to the teacher after class. He should see that another pupil who asks a difficult question is still welcomed the next morning. [16]

I would extend the same consideration to teachers. After years of teaching to a prescribed answer, a sudden instruction to 'encourage open discussion' may leave a conscientious teacher exposed. Give colleagues paid time to rehearse a difficult lesson together. Let one teach and the other observe whose questions are heard. If a parent complains, the head should be able to point to a published curriculum and stand beside the teacher who followed it. The adult asked to make a classroom safe for inquiry needs to experience some of that security too.

CHAPTER FOUR / THE PSYCHOLOGY OF EDUCATION

The afternoon a teacher changes her mind

A teacher writes a date on the board. A pupil says the date in the old newspaper clipping is different. What happens in the next minute matters. The teacher might ask the pupil to bring the clipping forward, find its publication date and distinguish the date of the event from the date on which it was reported. The newspaper could contain the error. So could the textbook. If the teacher was mistaken, she can correct the board, thank the pupil by name and use the corrected date in the next lesson. Children notice whether an adult can do this without losing her authority.

Build that experience into assessment. Give a pupil the chance to submit an early explanation, receive a question about it and make a second attempt. Ask her to identify the evidence that led her to change one sentence. An examiner can award marks for the quality of that revision. A child who simply agrees with the teacher may have little to add. A child who has thought hard about an objection will have something specific to say. Planning an approach, checking it and reflecting on the result can be taught explicitly in ordinary subject lessons. [17]

Private convictions deserve the same respect as private uncertainties. A pupil whose family prays and a pupil whose family has no religion should be able to examine the same evidence and earn the same marks. Nobody should be obliged to disclose belief, denounce a parent or repeat a political slogan to demonstrate independence. A good teacher can press a pupil hard on *how do you know?* and leave *what does your family believe?* entirely in the pupil's hands.

CHAPTER FOUR / THE PSYCHOLOGY OF EDUCATION

A place to try an idea

A school should make room for a young person to be wrong at modest cost. Suppose a group in Abadan believes the roof above a classroom is the main reason the room becomes so hot in the afternoon. Before anyone spends the school's money, the students can compare temperatures in several rooms at the same times, record which windows were open and note the shade. A student who suspects the windows matter more should be invited to design a comparison. Let the class inspect the measurements, including the awkward day when the pattern went the other way.

The human part of the experiment begins when one student has done most of the work and another speaks most confidently at the presentation. Ask each pupil to describe a contribution someone else made. Mark the quality of the measurements, the account of uncertainty and the way the group answered criticism. A quiet pupil who spotted the badly placed thermometer may have saved the class from spending money on the wrong change. Make room for her in the account of what the group learnt.

As questions become more complex, so do responsibilities. A university class can investigate how pupils experience heat in a classroom, but collecting information from children requires appropriate consent, independent ethical review where required, and care with privacy. The same seriousness belongs in medicine. An interesting idea and an enthusiastic supervisor are the start of a discussion about research involving patients. Scientific freedom gives us the right to ask the question. We owe the people who help answer it a genuine choice about taking part.

CHAPTER FOUR / THE PSYCHOLOGY OF EDUCATION

How a school earns trust

Parents have a legitimate interest in what a school teaches. Give them the textbook in advance, an opportunity to observe how a course is taught and a civil way to raise an objection. Suppose a parent objects to a lesson on evolution. The teacher can show the syllabus, the evidence the pupils will examine and the marking criteria. The parent can speak, the pupil can study, and the scientific curriculum can stand. No child should become the public representative of an argument between adults.

Ask schools to listen regularly to pupils who seldom volunteer. A short confidential survey might ask whether they knew where to take a complaint and what happened the last time they queried a mark. Invite teachers to examine anonymised answers with the school council. A rise in reported concerns can mean pupils have acquired enough confidence to report them. Read the comments and follow what happened to cases before treating a number as a verdict on a school. Publish the changes made, protect children's identities, and ask the question again the following term.

The test for me is quite personal. Could a student who disagrees with my politics read this book, take apart an argument in it and earn the highest mark in the class? I would want to read that paper. The student would have taken my purpose seriously. In a free Iran our children will reach views that some of us find uncomfortable. If we have taught them well, they will know how to tell us where our argument failed, and we will have the good sense to listen.

AFTERWORD

The first school year of a free Iran

If I could put three questions to the first education minister of a free Iran, I would ask what will change for a child on Monday morning, what teachers will find different by the end of term, and what the country will be able to check at the end of the school year.

On Monday morning, the child should find a functioning school. Pay the staff, keep the books and records available, and tell families which qualifications and examination dates will be honoured. Publish a short statement of the liberties pupils and teachers can exercise immediately. Give a named office responsibility for restoring access to people excluded for their beliefs. A young woman who lost her place at university months before graduation needs an answer about her remaining credits and when she can finish her degree.

By the end of the first term, teachers in a range of provinces should have helped review the most restrictive examination questions, trialled replacement lessons and reported what happened. Ask what they had to buy themselves and how much preparation time the new teaching required. Give librarians and technical colleges a place in that conversation. Publish the first open textbooks in formats that families can use, and let independent subject specialists record corrections where everyone can find them.

After a year, publish what families paid, which pupils stayed in school, how long appeals took and whether students and teachers could obtain the materials promised. Invite a parliamentary committee to hear directly from a pupil, a parent, a technician, a librarian and a head teacher. Give them the figures in advance and ask the minister to return with answers to the points they raise. That offers the country a basis for the second year’s budget.

When I think about the future of education in Iran, I come back to the girl in Abadan and the light she can see from a distant star. Perhaps she will become an astronomer. Perhaps she will repair engines, teach literature or do something for which we have no name today. What I want for her is the ordinary freedom to follow a question far enough to discover what she is capable of. What she chooses to do with that freedom is hers.

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