

# EVOLUTION AND RELIGION IN CONTEMPORARY HUNGARY

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**Abstract.** The relation between science and religion has always been a question of interest since the early 19th Century. Following international tendencies, in the past ten years a related polemic about evolution has become increasingly intensive in Hungary. The starting point of our research was the assumption that differences exist in the views of those with a factual knowledge of evolution (e.g. students who learned about evolution and studied aspects of it in laboratory, etc.), and those, whose attitudes towards evolution were formed exclusively by a general world view they devote themselves to. Subjects were university students. Questions we asked were the following: To what extent and in what way are students religious? Are biology students less or more religious than the average university student? Can religion encourage (or discourage) scientific thinking? Do insights of religion and of science complement or contradict each other? Do religion and science refer to the same kind of reality? What contributes more to a student's thinking about evolution: is it (lack or) existence of religious background or is it university education? Do students of biology attempt to reconcile evolution and creation? We discuss the background and presents and analyse the – sometimes surprising – results.

**Keywords.** evolution, religion, education, history of Hungary, science and religion controversy, Darwinism, creationism, Intelligent Design, sociology of knowledge.

## 1. THE CONTEXT

Ever since CHARLES DARWIN first presented his theory of evolution in *The Origin of Species by Means of Natural Selection* (1859) and *The Descent of Man, and Selection in Relation to Sex* (1871), an endless and fierce debate has been going on between the religious and the scientists. Darwinism is often considered to be against Christianity in the following four respects (MCGRATH 1999): 1. We have reasons to believe that the species of animals and the species of plants are continuously changing and evolving. The species existing today came into being in the process of evolution, they did not exist before, other species died out in the course of time. This theory questions the widespread view of (mostly Protestant) theology, that the biblical creation story should be understood as a one-time, unrepeatable act, one which formed the order of nature once and for all. 2. In the process of evolution there is struggle for existence, and in consequence of this competition, some species die out. However, the loss contradicts divine dispensation. Natural selection according to Darwin reminded many people to the traditional problem of the evil. Why does an almighty and benevolent God tolerate the suffering in the world? 3. The next problem is connected to the seemingly accidental processes of evolution. According to the theory, evolutionary development is the outcome of several accidental events in which obviously God's guiding hand did not participate. 4. The largest difficulty was caused by the position of man in nature. In the pursuance of Darwinism, every species including humans are results of biological evolution. That is, there is no substantial difference between man and animal with respect to their origin and development. The traditional Christian way of thinking holds man to be superior to other beings. He is the "crown of creation", he is the only one being created to "God's own image".

When talking about evolution, we may note that 'evolution' as a *process* is worth distinguishing from the *theory* of evolution from a strictly scientific point of view. The theory of evolution is just a possible explanation, and there can be many other theories or

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explanations besides or against this particular one. The disproof of this theory would not, therefore, disprove the notion of evolution itself. Although *in principle* the supporting evidences of the *theory* of evolution are thus completely different from the evidences of the *process* of evolution, the actual situation is much more complex as in their present form both of them are based on Darwin, who considered them in a unity. In spite of this difficulty, it should be clear that while the theory of evolution is far from being at the stage where it could be the basis of canonical textbooks to can be used for twenty or fifty years unchanged, as is the case with electrodynamics, and while the researchers of evolution often disagree on many questions, the fact of the process of evolution is considered to be in science essentially as certain as the fact of gravity.

Although the official position of the Catholic Church on the questions of science has been modified several times recently, and it became nearly supportive of it, it is still ambivalent on evolution. In 1950, Pope Pius XII called the theory of evolution a possible, serious hypothesis. On October 22, 1996, Pope John Paul II stated his position<sup>2</sup> to the Pontifical Academy of Science, according to this, in possession of our new knowledge it can be now ascertained that *the theory of evolution is more than a hypothesis* and it seems to play an important unifying role in the different territories of science. The news was interpreted by the world as the Catholic Church accepting Darwinism. Nevertheless, reading carefully the original text or the explanations added by the Vatican<sup>3</sup> it should be realized that – in the said form – this is not the case. Darwin's name was mentioned at all and the Pope talked about *various kinds of rival theories* of evolution. Still the statement can be interpreted as claiming that most parts of explanation of the origin of living beings belong to the competence of science. Indeed, faithful scientists play an important role in forming the opinion of the Churches, and these scientists – mainly in the USA – often establish civil associations to spread their enlightened opinions.

Nevertheless, the evolutionary polemic that seemed to calm down has been intensifying all over the world more recently. The situation is the most dramatic in the USA, where beliefs concerning evolution have a special significance for more than one reason. It is well-known that American life is strongly penetrated with religion, or, more precisely, with a joined form of religion, politics and the social order, where to be an atheist means supporting upsetting or subversion as well. Obviously, in this mental climate, questions concerning the opposition of rational knowledge and faith have special importance. Evolution is clearly one of the key issues. It should be noted as well, that for interpreting the Biblical creation the mostly Protestant Americans don't have a canonical guidance similar to the Papal Encyclicals for the Europeans. American public opinion and those who form it usually have to rely on their own, often spontaneous, sometimes naive interpretations. In this situation Creation and Science can easily constitute a contrast to each other. Taking it literally, the Biblical explanation of the world runs counter to the statements of science. No doubt, if someone has a strong commitment to social order (which, as stated above, means a commitment to a form of religiosity as well), then the footing for the competition of ideas to reduce cognitive dissonance become unequal, which may prefer religious belief to scientific knowledge. And, since most people are not philosophers or philosophers of science, they may disregard subtle questions whether the two kinds of explanation have the same goal and method, or if they refer to the same kind of reality.

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<sup>2</sup> <http://www.cin.org/jp2evolu.html>

<sup>3</sup> See George Sim Johnston's article on the webpage of the Catholic Information Center (<http://catholic.net/RCC/Issues/Pope-and-Evolution/pope-and-evolution.html>), and Mark Brumley in Catholic Dossier (<http://www.catholic.net/RCC/Periodicals/Dossier/0102-97/Article3.html>).

## 2. THE HUNGARIAN SITUATION

The polemics on evolution seem to intensify in Hungary as well. Yet the Hungarian situation has a different characteristic mainly because of recent historical events. Following the second World War, after the communist takeover the official ideology became hostile towards every form of religion or religious manifestation. In 1946 László Rajk, Minister of the Interior eliminated by order all social organizations and civil societies that belonged to or maintained connections with a Church (e.g. KALOT, KALÁSZ, Hungarian Scout Association, etc.) The next restrictive step was to bring the schools under government control and then to change the educational system so that Bible classes became optional. Finally, churches were gradually losing the role they played in the socialization of the society beforehand. The secularization guided by the Communist Party meant also that the Churches were placed under a strict governmental control, their scope for action was narrowed, and step by step, their competencies were lost. In 1951 the State Office for Church Affairs was established to provide political control over the Churches. This was the Office where decisions were made concerning who the posts in the Churches, and also this Office exercised the rights to censor the publication of books and newspapers of the Churches. Furthermore, the institution was penetrated by the “political police” (i.e. Communist state security authorities).

A process of consolidation started in the second half of the 60s when Hungary re-established diplomatic relations with the Vatican. The most important event of this process was a meeting between János Kádár and Pope Paul VI. in the Vatican in 1977. This was the first time the Catholic Head of the Church received a ruling Communist Party leader. From the 70's on, Churches were allowed to broaden their charitable and cultural institutions and to extend their activities, although within limited frames. In return for these concessions, priests were usually loyal to the government, they did not directly question the “socialist” regime in preaching, and moreover, from time to time they participated in actual Communist campaigns.

The autonomy of the Churches was restored at the end of the 80's, and the beginning of the 90's. In 1989 the State Office for Church Affairs was dissolved, its orders invalidated. The monastic orders could start to work again, the presence of religious broadcastings in the media was re-established, and censorship of Church publication was abolished. The Parliament declared the separation of State and Church, and pronounced freedom of conscience and religion to be a fundamental human right. Restrictions on Bible classes in the schools were repealed. Simultaneously with this transformation of the educational system, several denominational schools started to work, and, by the beginning of the 90's the foundation of Protestant and Catholic Universities were also laid down.

While Western Europe has seen a religious decline over the past decades, and the membership and importance of the Churches decreased (although the indicators of religiosity are still higher than those of the former Communist countries), in the Central European region the situation is quite the opposite. Here, in the last half century religiosity covered a long way that gives a time plot similar to a sinus-curve (TOMKA 1999). The manifestations of religiosity between 1947-53 – in spite of the hard persecution of the Churches - emerged to a level higher than the level before the second World War. Hereupon, religiosity seemed to stagnate for a short period. Between 1958 and 1978, in many countries of the region people lost their religiosity quickly and to such a large extent that was unparalleled anywhere in the world before. There were many different reasons for this transformation. It is usual to allude to the hopelessness after the revolution in 1956, to the organization of a collective farm system and the collapse of the rural society, the fast expansion of the electronic mass communication media, and the so called “goulash Communism” or “don't care welfare”. 1978 is a decisive year, however. In 1978 the previously “underground” religious renaissance took

on and became statistically equal to the degree of lapsing from the faith. The formerly decreasing tendency stopped, and turned backward. From 1978 on, the degree of religiosity has been showing a slow but continuous increase.

The idea of superiority and “final victory” of the scientific world view, as an heir of 19<sup>th</sup> Century positivism, was strongly propagated by the Communist regime. During the decades, many generations’ thinking was influenced by this view, which at the same time denied religions and considered religion and science to be irreconcilable and contradictory. Due to a lack of authentic information typical for this period, as a side consequence, generations grew up without any chance to obtain basic knowledge concerning religion – or to critically discuss it.

By the time of the democratic transformation in 1989, most of the people lost their own traditions, including their religion, and many of them were misinformed or uninformed regarding other traditions. On the other hand, they were demonstrably half-educated in the natural sciences as well. Besides, there were those religious churchmen, most of who had to keep their faith in secret for many years, and finally, there were several one-sidedly educated natural scientists. These people, taken together, became the participants of the emerging discourse on the relationship of science and religion in Hungary.

Skepticism and criticism towards evolution seems to increase recently. An example is a conference on March 18, 2003 in Budapest, organized by the ÉRTEM group.<sup>4</sup> (That is, “Értelmes Tervezettség Munkacsoport”, in English: Intelligent Design Working Group.) The participants of the meeting addressed an open letter<sup>5</sup> to the Minister of Education in which he was challenged to provide the theory of Intelligent Design a platform, and to make it part of the curriculum of various levels of public education. Representatives of different religious groups, even a Catholic bishop signed the petition. Following international trend, the participants of the conference announced the theory of Intelligent Design to be a scientific challenger to the biological theory of evolution. The group’s members come from the most diverse of religious backgrounds (from Krishna faith to Christian fundamentalism), but they all agree on one thing, to refuse the intention and possibility to reconcile divine Creation with Evolution.<sup>6</sup> After the publication of their open letter, a fierce debate unfolded along the columns of *Népszabadság*, the largest daily newspaper in Hungary.<sup>7</sup>

Lately in Serbia the State Secretary for Education, Liljana Colic wanted to suspend the teaching of evolution.<sup>8</sup> Although later the departmental order was repealed, the scandal received a good press covering and the ÉRTEM group also made its voice heard about it several times.<sup>9</sup> From time to time they publish books as well on this issue.<sup>10</sup>

Although the Democratic Transformation in Hungary is a good 16 years old, the educational system changes very slowly. This is partly because in the schools the same

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<sup>4</sup> See: <http://www.ertem.click.hu/keret.cgi/?munkacsoprol.html>

<sup>5</sup> The letter can be read here: <http://www.ertem.click.hu/keret.cgi/?nyiltlevel.html>

See also: [http://www.vinok.hu/hu/szolgalatasok/hirszolgalat/riportok/2003/intelligens\\_termeszet.shtml](http://www.vinok.hu/hu/szolgalatasok/hirszolgalat/riportok/2003/intelligens_termeszet.shtml) and <http://www.szkepszis.hu>

<sup>6</sup> Although none of the official teachings of the traditional Churches reflect such an extreme point of view on the question, the fact, that prominent representatives of these very same Churches participate in such an initiative may question the acceptance or effectiveness of the teachings.

<sup>7</sup> See: Marosán György: „Alig tapad ez a sár!” (2003.05.12.), Tasi István: „Nem rajtunk múlik” (2003.05.21.) and Mező Ferenc: „Mogyorófavessző” (2003.05.26.) on <http://www.nepszabadsag.hu>

<sup>8</sup> Story from BBC NEWS: <http://news.bbc.co.uk/go/pr/fr/-/1/hi/world/europe/3635794.stm> Published: 2004/09/07 18:50:43 GMT

<sup>9</sup> Ld. Tasi István: „Teremtés vagy evolúció” (*Népszabadság*, 2004.10.15.), a Letter to the Editor by Válás György and the reply by Tasi István: „Ki vezeti félre a nagyközönséget?” (*Népszabadság*, 2004.11.15.). See also Tasi István, Letter to the Editor to the article „Mit tesz Isten?” (*HVG*, 2004.09.25.)

<sup>10</sup> The latest one is: Tasi István (szerk.): *A tudomány felfedezi Istent. Intelligens tervezés – az evolúcióelmélet új riválisa*. Aeternitas Irodalmi Műhely, Bp., 2004.

teachers continue to work as before, and partly because textbooks and curricular materials (especially in the natural sciences) are almost unchanged. In the meantime, more and more children grow up in the newly religious families. For them especially, it can be very difficult to establish a harmony between the seemingly (or entirely) contradictory worldviews. The more so, because it is often the kind of contradiction that teachers and textbooks suggest. What seems to be a much more dangerous phenomenon is that different new fundamentalist religious groups appeared and they try to open an ever-widening gulf between the territories.<sup>11</sup> A recent example for this attitude is the “Calvinist Creation Circle” which announced a competition for secondary school students for writing essays to prove the *incompatibility* of the Biblical creation and evolution?<sup>12</sup>

### 3. EFFECTS OF BACKGROUND KNOWLEDGE ON THE OPINIONS

To understand the manifold relationship of Religion and Evolution in Hungary was the aim of a national-wide research initiated by our department, the History and Philosophy of Science Department of Eötvös University. The project “*Religion and Evolution in the contemporary and 20<sup>th</sup> century Hungary*” consisted of several subprojects including a historical study of the reception of the theory of evolution in Hungary, an analysis of the contemporary debates on evolution in public documents (such as books and newspaper articles), work on the historical background and the documentation of the public dialogue on evolution and religion, and furthermore, the foundation of a Hungarian Darwiniana, a print and electronic archive for articles, books, and documents on the issue.

In the following we give a brief account of the results of one of the surveys of the project. The starting point of this empirical research was the assumption that it is worth examining the differences in the views of those who have a factual knowledge of the matter of evolution (e.g. students who learned about evolution as part of their curriculum, and examined aspects of the process in the laboratory, etc.), and those, whose attitudes are formed solely by the general world view they devoted themselves to. Our subjects were university students. The questions studied were the following:

- To what extent (and in what way) are students religious? As to some views, the science of biology challenges the religious world view, so the question arises, whether students of biology are less (or more) religious than the average university student?
- What is the relation between science and religion for a university student? Can religion encourage (or discourage) scientific thinking? Do insights of religion and insights of science complement or contradict each other for them?
- Do religion and science refer to the same kind of reality?
- What contributes more to a student’s thinking about evolution: is it the religious background (or lack of it) or is it university education?
- Do students of biology have problems reconciling the theories of evolution and creation? Or do they see a contradiction between them? How do they think the two concepts are reconcilable, if so?

Data was provided by a survey that was conducted among university students of two Hungarian universities (of Eötvös University, Budapest and the University of Szeged) in the Fall Semester of the academic year of 2003/2004. Questionnaires were completed during a regular class by 562 students, among whom 369 were the students of Eötvös and 193 students were from Szeged. Of the subjects, 318 students studied biology, 126 studied some other

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<sup>11</sup> See e.g. [www.szkepszis.hu](http://www.szkepszis.hu), [www.golgota.hu](http://www.golgota.hu), [www.geocities.com/magyarkreacionizmus/](http://www.geocities.com/magyarkreacionizmus/)

<sup>12</sup> See: [www.kezdetek.hu](http://www.kezdetek.hu)

branches natural science and the rest of 104 undergraduates were studying in the faculty of Humanities (an additional 14 students didn't answer the question.)

### 3.1 RELIGION

Asking about science and religion at universities it is quintessential to understand how, to what extent, and in what manner students are religious.

Students do believe!

#### 1. Table

Are you a religious person? (%)

Yes, I am.	34,8
No, I am not.	25,1
I am religious in some respect.	35,5
I don't know.	1,1
I don't want to answer.	3,5
Total	100,0

34,8 percent of respondents say they consider themselves to be part of some religion and an additional 35,5 percent say that they are religious in some respect. This totals 70,3 percent. Only 25,1 percent declare themselves to stay out.

#### 2. Table

What is your religious denomination? (%)

Roman Catholic	40,9
Protestant	11,2
Evangelic	3,7
Other Christian	3,5
Jewish	0,4
Hindu	0,4
Buddhist	1,9
Other	3,9
None	23,2
I don't want to answer	10,9
Total	100,0

Our result slightly differs from the results of the national census in 2001<sup>13</sup> (%):

Roman Catholic	51,9
Protestant	15,6
Evangelic	3,0
Jewish	0,1
Other	1,1
(Eastern Orthodox)	(2,6)
None	15
No answer	10,7
Total	100,0

We can see that fewer students belong to some traditional church in our sample than in the national census. At the same time, the proportion of "other" religions is much higher. This shows that probably young people are more open to new religious movements in Hungary.

<sup>13</sup> [www.nepszamlalas2001.hu/dokumentumok/pdfs/vallas.pdf](http://www.nepszamlalas2001.hu/dokumentumok/pdfs/vallas.pdf)

A.M. FARKAS (1998) observed the emergence of the various Hungarian non-Christian new religious movements (first of all, Buddhism) and remarked that most members of these groups have the characteristic of a mixed identity, e.g., the followers confess to be Buddhist *and* Christian or Buddhist *and* Jewish etc. at the same time.<sup>14</sup> We wanted to test this hypothesis, so we let the students mark more than one answer to the question of religious denomination.

### 3.1. Table

What is your other religious denomination? (2.) (person and %)

Protestant	1	0,2
Evangelic	1	0,2
Jewish	1	0,2
Hindu	2	0,4
Buddhist	14	2,5
Muslim	1	0,2
Other	2	0,4
None	2	0,4
Doesn't mark two answers.	544	95,8
Total	569	100,0

### 3.2. Table

What is your religious denomination? \* What is your other religious denomination? (2.):

What is your religious denomination?	What is your religious denomination? (2)								Total
	Protestant	Evangelic	Jew	Muslim	Hindu	Buddhist	Other	None	
Roman Catholic	1	1		1	1	8		1	13
Protestant			1		1	1	1		4
Evangelic						2			2
Other Christian						1			1
Jew						1			1
Hindu						1			1
Buddhist							1	1	2
Total	1	1	1	1	2	14	2	2	24

Of the 562 students asked, 24 students grasped the opportunity to mark more than one answer. Most persons with double identities are Catholics (13 persons) or Protestant (4 persons). Most students with some kind of double identity confess to be a Buddhist. We may suppose that those students who confess themselves to be a Buddhist and a Christian at the same time wanted to really tell us that they are Christian by birth (i.e. they are baptized), but concerning their religion, their present world view, their faith, etc. they are Buddhists. If this is true, we can hypothetically add up all the persons who confessed themselves to be Buddhists either in the first or the second place and we get the somewhat amazing result that from 562 students 25 are Buddhists, which makes up 4,4 percent of the whole sample. This means that Buddhism is the third most important religion after Catholicism and Protestantism among the university students tested. In particular, Buddhists precede Evangelicals, other Christians and the Jewish - in a traditionally Christian country!

The regularity and the manner of the practice of religion were also asked.

<sup>14</sup> Farkas Attila Márton: *Buddhizmus Magyarországon, avagy az alternatív vallásosság egy típusának anatómiája*. MTA PTI Etnoregionális Kutatóközpont Munkafüzetek 50. Budapest, 1998.

#### 4. Table

Apart from weddings, funerals and christenings, about how often do you attend religious services? (%)

More than once a week.	4,7
Once a week.	12,1
Once in a month.	8,3
Only on special holidays.	16,7
Once in a year.	9,5
Less often.	12,3
Never, or practically never.	31,6
I don't want to answer.	4,7
Total	100,0

#### 5. Table

Do you take some moments of prayer, meditation or something similar? (%)

Yes, regularly.	29,9
Yes, sometimes.	42,4
Never, or practically never.	23,6
I don't want to answer	4,2
Total	100,0

25 percent of the respondents go to church regularly (at least once in a month). At the same time, 29,9 percent of them pray regularly, which means that part of the students don't practice their religion within organized, institutional frameworks. There is no student visiting church habitually who doesn't also pray or meditate regularly. At the same time, there are many students (64 persons) who, although pray or meditate regularly attend religious services only once in a while, at most of them only on special holidays.

Believers do not have a homogenous image of their God.

#### 6. Table

Which of these statements comes closest to your beliefs? (%)

There is a personal God.	35,5
There is some sort of spirit or life force.	23,2
There is an impersonal directing law in the world.	13,7
I don't know what to think.	6,5
I don't think there is any sort of spirit, God, life force or impersonal directing law of the world.	10,7
I don't want to answer.	10,4
Total	100,0

We have asked about the family background as well. Religious education was measured by three variables.

#### 7.1. Table

Did you attend Bible classes? (%)

No, I didn't.	30,8
Yes, I did.	66,8
No answer.	2,5
Total	100,0

### 7.2. Table

Did your parents give you a religious background? (%)

No, they didn't.	58,3
Yes, they did.	35,0
No answer.	6,7
Total	100,0

### 7.3. Table

Did your grandparents give you a religious background? (%)

No, they didn't.	48,9
Yes, they did.	45,0
No answer.	6,2
Total	100,0

66,8 percents of all the students attended Bible classes, at the same time, a religious background was given by the parents or the grandparents to only less than half of the students. The recent history of Hungary discussed earlier can suggest a possible explanation for this phenomenon. After the democratic transformation in 1989 there was a new freedom to attend Bible classes, and it was possible to learn about religion not only in the churches but also in most of the schools. On the other hand, parents grew up in the anti-religious atmosphere of the Kádár-era of Communism, which (as we know from other studies) demonstrably influenced their way of thinking and their habits leading to a rejection of religion. Yet, taking the presence of parental advice and influence granted, it is likely that many of the parents believed that “just to be on the safe side” it won't do much harm if their children attended Bible classes in the new, doubtful times.

Those students who received all aspects of their religious education from their family are more religious than their fellow students who didn't get any religious education at all. They visit churches more regularly, and pray or meditate more often as well. Religious education in Hungary means education in the traditional religions such as the Catholic, Evangelic, Protestant or Jewish religion. It cannot be surprising that students obtaining religious education prefer the traditional Churches, and they rather believe in a personal God than in some sort of spirit, impersonal life force or directing law in the world. On the other hand, students having no religious background usually either don't believe in any kind of God or spirit, or they are not sure what to think.

Respondents from villages are more religious than students from larger cities and Budapest, and they tend to follow the traditional religions. Students growing up in Budapest or in some other larger city of Hungary are more responsive to the various non-Christian new religious movements.

Parents' education and job has no influence on the students' religiosity. There is no significant difference between the different social classes and the positions of the family occupied in the society with respect to the students' religiosity either. There are no differences across the majors (biology, physics.... etc) and the years (freshman, sophomore... etc) either.

## 3. 2. SCIENCE

Reading through the continuously growing literature on the science and religion, one can see the same question arising again and again: Does religion encourage or hinder scientific thinking? Do insights of religion and insights of science complement each other or do they contradict? Do they refer to the same territory of reality or they need to be interpreted on a

totally different basis? To answer these questions, it is not enough for us to form a notion of the students' religiosity but we also need to understand what they think about science.

### 8. Table

Do you think that you can get true knowledge from science? (%)

Yes I do.	50,3
More or less.	39,4
No, I don't.	1,8
I don't know.	4,6
I don't want to answer.	4,0
Total	100,0

Roughly half (and only the half!) of the students think they can obtain true knowledge from science. However, 39,4 percent of the respondents believe that knowledge gained from science is only more or less true. Who tends to think this way? There seems to be no significant difference in gender, majors, or years in this respect. Even religion has no importance on this case. Who are those students then, and what reasons do they give for this cautious answer?

In the questionnaire, respondents marking the answer in question had the opportunity to explain their views in detail. So let's see what kind of explanations they've come up with. The following typology is only a rough estimate as most of these explanations overlap.

Among those who named the reasons, the greater number (38 persons) referred to the fallibility of science, the insight that newer researches can modify previous results. Something that is true today can turn out not to be true tomorrow. An additional 12 persons wrote that our knowledge is necessarily incomplete, so we can only try to guess. *"There are things not realized yet, just like the flat Earth long ago."* (Possibly means that people who believed in the flatness of the Earth long time ago did not realize that it was actually round.)

It is impossible to sharply distinguish the second largest group (of 18 students) from the above-mentioned one: they complain about the lack of evidence. They wrote for example that *"science is the aggregate of verified and non-verified knowledge"*. According to them, the verified facts are not separated from the assumptions. Some of them talked about some kind of a willful misleading in action. In one answer, the lack of evidence was accompanied by an issue of faith: *"Every science gives you true knowledge inside its own model, but the model is something you accept without evidence"*.

An additional 13 students suggested some sort of a conspiracy theory. *"I think there is much knowledge that is kept secret, and [known] mistakes are advertised"*. Two persons believe that science can only give true knowledge *"up to the point that it's in its own interest"*. Seven students protested against the influence of the political and economical interests in science. Finally, one student quoted the distortion of history by citing examples.

Twelve respondents focused attention on the impossibility of knowing the objective reality. To see an example: *"Probably there is something like objective reality, but because it is unknowable it is not important after all, however, acquiring knowledge is good."* Two students referred to faith or religion: *"We don't know a lot of things about the origin of the universe. We assume that there was matter from the very beginning. Religion assumes the existence of God."*; *"This is based on faith. And we believe in what we think is true."* One student drew a practical conclusion: *"Nothing should be accepted, there are only assumptions, but we should work on the basis of something, isn't it?"*

It is hard to sharply separate the following twelve beliefs as well; here some kind of a philosophical reference appears. Two students asked back. *"What is truth?"* A third one added: *"False knowledge is also important because truth can be observed only in the light of*

that.” Two students blamed the conservatism of science: “*There are all the time discoveries that are true, yet they are not considered to be scientific.*” One student explicitly referred to Kuhn and Feyerabend to phrase limitations. Another one noted that “*scientific theories can be falsified*”. One student wrote that “*science says what it believes to be true and not what really is true*”. According to two other students science “*reflects the society of the era, and that is not always impartial*”.

Eleven students pointed out that the answer “*depends on which discipline we are talking about*”. Usually it is the study of history they gave as a negative example.

Some students wrote that science can only give “*partial truth*”, “*science throws light upon truth only from special point of views*”. “*Every science gives its own truth, which often contradict to each other.*”

Finally there were only six students conforming to our previous expectation that they referred to religion: “*Science is only a tool to get better knowledge about God*”; “*Science has many reality but is not enough by itself*”; “*Science is often against religion*”. One of them wrote that “*although science can give true knowledge, except when it is about evolution, that is about the origin of men, animals and the appearance of life*”.

In the second question of our questionnaire we wanted to qualify opinions concerning biology. Students of biology were assumed to have a totally different view on biology than students of other majors, as they have a much deeper knowledge of the subject, especially in higher years. At the same time we also hypothesized to find religious students to have some problem with pledging oneself to study biology, as creation is more or less opposed to one of the most important theory of biology, evolution. However, and contrary to these expectations, there were no significant differences between majors, between senior and juniors, and also the influence of religion was negligible.

### 9. Table

Do you think that biology can give as reliable knowledge as all the other sciences?(%)

There aren't any differences among sciences in this respect.	63,3
Biology gives more reliable knowledge.	20,7
The other sciences give more reliable knowledge.	6,0
I don't know.	7,6
I don't want to answer.	2,5
Total	100,0

The majority of the students (63,3 percent) think there aren't any differences among sciences. At the same time, according to 20,7 percent of the respondents biology gives more reliable knowledge (!). Constraining the analysis to only students of biology leaves the ratio almost identical: 18,9 percent of the students of biology, that is, 55 students have the opinion that biology gives more reliable knowledge. What did these respondents think when marking the answer? The survey was completed with oral interviews with these students, from which the following three types of explanation emerge:

1. Biology is more reliable than the other sciences because it deals with visible things around us, and not abstract concepts or invisible elementary particles like, for instance, physics.
2. Biology is more reliable than the other sciences because in biology everything is based on experiments that can be repeated many times and the results would be identical
3. Biology is more reliable than the other sciences because it deals with living beings. Living beings have a soul, while inorganic things don't have a soul. Creatures with a soul are more real than things without soul, therefore, biology deals with the most real of things.

In the questionnaire we also asked explicitly if the student accepts the theory of evolution. We supposed that religious students accept the theory less than do their atheist fellows.

#### 10. Table

Do you accept the theory of evolution or don't you? (%)

Yes, I do.	70,3
No, I don't.	3,5
More or less.	19,3
I don't know.	3,5
I don't want to answer.	3,3
Total	100,0

Most of the students (70,3 percent) accept the theory of evolution, and just a very few (only 3,5 percent) gave a flat refusal. However there is a third group of respondents who can only accept it to some degree. The questionnaire gave a possibility for them to define their positions in detail. Let's see what kind of explanations these students gave.

Most of them (26 persons) pointed to the lack of evidence and to *"the missing links"*. *"There is not enough living or fossilized evidence to prove evolution with absolute certainty"*. *"The principle, the essence of the theory can be accepted, but the smaller details raise certain difficulties and problems"*. An additional two students emphasized the notion that they can only accept some parts of the theory: *"I can accept the existence of the phenomena of evolutionary development but the earliest parts of phylogenesis, events in the distant past only with reservation"*; *"I accept the fundamentals, but it is much more complicated than according to the classical Darwinian theory"*. Several students admitted that their knowledge is incomplete concerning the problem of evolution: *"I don't have all the knowledge to accept all its claims undoubtedly"*.

The second group with an almost identical size (22 persons) directly refers to religion, that is, they can accept the theory of evolution up to the point that *"it does not exclude the existence of God"*. Some feel the evolutionary explanation is insufficient: *"It must have played some role, but it couldn't be enough for the formation of present days' life by itself."* Two students questioned *"the evolution of man"*: *"It is not sure that we descend from Apes"*. Some of them seem to accept evolution unwillingly but consider religion to be just as important: *There is change in the phylogenesis of animals, but being a faithful I believe it can not replace the Creator"*. [I accept evolution up to the point that] *"it stays within the territory of science and does not try to solve the "final questions" and does not try to give absolute answers."* Some argue for microevolution: *"Species come into being today too; but this is only microevolution. For example: subspecies separate definitely. But life descends from God and all the (main) species of animals as well, in which an ability to dynamic change is created"*. One student makes the interesting remark that *"it is likely that the theory of evolution and the teachings of religion have some kind of similarity"*. According to a follower of Krishna *"there is a spiritual evolution in which the soul moves to species of higher and higher quality, and finally it reaches the human mode of existence."*

An additional nine students also commented on their answers, but these commentaries cannot be catalogued to types. Let's see a few of them. One of the students says: *"I can see many problems in it [i.e. evolution]."* Another student is uncertain because of *"the diversity of living beings"*. One student wrote: *"the driving force is too small for such a big result"*. Conspiracy theories appear too: *"I think it is manipulated. There are many books and articles about that, it is only the belief of one concern that is permitted"*.

The members of the first and the third groups discussed above offered seemingly more scientific arguments. However if we observe their answer concerning their religiosity it can be seen that eighteen students confess themselves to be definitely religious, the other fifteen confess to be religious in some respect, and there is only two students that are not religious. That means that almost everyone of those who can accept evolution only up to some point (or refuse evolution more or less) – at least those who defined their positions in details – is religious to a certain extent. 110 students answered that they can accept evolution more or less, among these were the 57 respondents giving details. All of them except two were religious, which means that it is more important for the religious students to express their opinions on evolution than it is for the atheists.

The following cross-table shows the relation between religiosity and the acceptance of evolution:

11. Table

Do you accept the theory of evolution? \* Are you a religious person?

Do you accept the theory of evolution?	Are you a religious person?			Total
	Yes, I am.	No, I am not.	Yes, I am in some respect	
Yes, I do.	120 30,8%	124 31,8%	146 37,4%	390 100,0%
No, I don't.	14 73,7%		5 26,3%	19 100,0%
More or less.	55 51,4%	11 10,3%	41 38,3%	107 100,0%
Total	189 36,6%	135 26,2%	192 37,2%	516 100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37,817	4	0,000

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V	0,191	0,000
		516	

The table shows a moderately strong relation. Although most of the religious students accept evolution, there is a higher ratio of refusal among them than in the average. The non-religious students usually accept evolution. Most of those students who are religious in some respect tend to accept evolution; however, quite many of them have some or another problem to accept this theory. One of the cells of the table is empty. There is no student who is not religious and does not accept evolution at the same time: all of those students who refuse evolution are religious. Being religious seems to be the only criterion to refuse evolution.

At the outset we expected a sharp difference between the students of biology and other majors, because students of biology learn about evolution and they can observe it in the laboratories, etc. So their opinion on evolution may not be as polarized as of those who don't know precisely what the theory is all about. In the opinions of the latter religion was supposed to play a large role in refusing evolution. Contrary to these natural expectations, we have found no differences between the students of the various majors.

To what extent did the years that students have spent at the university influence their responses? We assumed that the more time a student deals with biology, the more "direct" experience she gains about evolution, so this student is familiar with many more facts (or doctrines) to consider when answering the question. Now we limited our observations only to the students of biology. The earlier noticed relation appeared only for the first-year students,

whereas in the table of the seniors, the two variables, acceptance of evolution and religiosity, were independent from each other! The result supports our initial hypothesis. For a senior, the selected answer is by no means so explicit a challenge against evolution. Knowledge gained at the university seems to prevent them to rely solely upon a religious explanation when they have to judge the theory of evolution. Unfortunately, our sample was too small to draw a formal conclusion, but this remarkable phenomenon needs further observation in a larger survey. The issue at stake is not less than one of the most important aspects of the war between creationists and evolutionists: How well is the theory (and the mechanism) of evolution known by those who refuse it?

We also wanted to find out if the students think that evolution and creation are reconcilable. We assumed that the question is only important for the religious student, who has already thought about the issue and tried to make the two ideas consistent or contradictory to each other. On the other hand, the same question was perhaps never been raised by the non-religious students, so they wouldn't think the two theories are reconcilable. Especially in Hungary, where they learned in the elementary and secondary school that science and religion contradict each other.

### 12.1. Table

Do you think that evolution and creation are reconcilable theories? (%)

The two theories are reconcilable.	48,3
The two theories are against each other.	37,3
I don't know.	9,5
I don't want to answer.	4,9
Total	100,0

### 12.2 Table

Do you think that evolution and creation are reconcilable theories? \* Are you a religious person?

Do you think that evolution and creation are reconcilable theories?	Are you a religious person?			Total
	Yes, I am	No, I am not	Yes I am in some respect.	
The two theories are reconcilable.	142 53,0%	29 10,8%	97 36,2%	268 100,0%
The two theories are against each other.	42 20,8%	92 45,5%	68 33,7%	202 100,0%
I don't know.	8 14,8%	16 29,6%	30 55,6%	54 100,0%
Total	192 36,6%	137 26,1%	195 37,2%	524 100,0%

#### Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	99,446	4	0,000

#### Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V 0,308	0,000
	524	

Religious students rather tend to think that evolution and creation are reconcilable theories, while non-religious students are more likely to believe these theories to contradict. Most of those who are religious in some respect hold the two theories to be reconcilable; also the ratio of irresolute respondents is the highest in this group.

We also compared the different religions concerning evolution. We reduced religions into three categories:

### 13.1. Table

What is your religious denomination? (%)

Judeo-Christian	59,8
Other	6,2
I am not religious.	23,2
I don't want to answer.	10,9
Total	100,0

### 13.2. Table

Do you think that evolution and creation are reconcilable theories? \* What is your religious denomination?:

Do you think that evolution and creation are reconcilable theories?	What is your religious denomination?			Total
	Judeo-Christian	Other	None	
The two theories are reconcilable.	207 82,1%	18 7,1%	27 10,7%	252 100,0%
The two theories are against each other.	96 49,7%	14 7,3%	83 43,0%	193 100,0%
I don't know.	28 59,6%	3 6,4%	16 34,0%	47 100,0%
Total	331 67,3%	35 7,1%	126 25,6%	492 100,0%

#### Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	59,740	4	0,000

#### Symmetric Measures

		Value	Approx. Sig
Nominal by Nominal	Cramer's V	0,304	0,000
N of Valid Cases		323	

Those who follow religions based on the Bible outnumber followers of other religions and non-religious students when it comes to thinking that the two theories are reconcilable. The members of the other two groups usually prefer to choose that the ideas of evolution and creation contradict to each other.

We obtained almost the same results when comparing the question to the regularity and the manner of practicing religion. See, for example, the following table.

### 14. Table

Do you think that evolution and creation are reconcilable theories? \* Do you take some moments of prayer, meditation or something similar?:

Do you think that evolution and creation are reconcilable theories?	Do You take some moments of prayer, meditation or something like that?			Total
	Yes, regularly.	Yes, sometimes.	Never, practically never.	
The two theories are reconcilable.	121 45,7%	109 41,1%	35 13,2%	265 100,0%

The two theories are against each other.	37 17,8%	92 44,2%	79 38,0%	208 100,0%
I don't know.	8 14,8%	32 59,3%	14 25,9%	54 100,0%
Total	166 31,5%	233 44,2%	128 24,3%	527 100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	66,902	4	0,000

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V	0,252 527	0,000

To sum up, we find that religious people are more likely to think that the two theories are reconcilable, while most of the non-religious tend to believe that they are contradicting.

We compared the question with other variables of the questionnaire. No significant differences between majors, years, or dimensions of students' family background were found.

We also wanted to find out how students think the two concepts are reconcilable, if so? Three alternative answers were given to them in advance: the official view of the Catholic Church, the opinion of Teilhard de Chardin, and a classical deist position. Students also had the possibility to express their own, different point of view.

16. Table

How do you think the two concepts (evolution and creation) are reconcilable? (%)

Both of them are true in their own dimension, at their own level.	41,8
God works inside the evolution process directing it from within.	21,1
God created the world, but then the laws of evolution do the rest.	20,0
Else, namely...	14,5
I don't know.	2,5
Total	100,0

Most of the students (41,8 percent) think that both theories are true in their own dimension, or at their own level. Those who chose either the second or the third answer together amount to approximately the same size as this first group. An additional 14,5 percent of the students suggested something different.

This question was answered by only half of the students, ie. By those, who replied positively to the previous question, asking if the two theories are reconcilable. Most of the respondents were religious (89,4 percent), which is in compliance with our previous expectation. We also wanted to know how the intensity of their religiosity influences the choice in marking one of the answers. See for example, the following table.

17. Table

How do you think the two concepts (evolution and creation) are reconcilable? \* Apart form weddings, funerals and christenings, about how often do you attend religious services?

How do you think the two concepts are reconcilable?	How often do you attend religious services?			Total
	Regularly, min. once a month	Rarely	Never, almost never	
Both of them are true in their own dimension, on their own level.	33 30,6%	34 31,5%	41 38,0%	108 100,0%
God works inside the evolution directing it	31	12	14	57

from within.	54,4%	21,1%	24,6%	100,0%
God created the world, but then the laws of evolution work.	25 47,2%	16 30,2%	12 22,6%	53 100,0%
Else	15 37,5%	4 10,0%	21 52,5%	40 100,0%
Total	104 40,3%	66 25,6%	88 34,1%	258 100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20,214	6	0,003

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V	0,198 258	0,003

Those who attend religious services regularly tend to agree with the idea that God works inside the evolution process in higher ratio than the ratio of all respondents, and in much lesser ratio they share the official view of the Catholic Church or select something else. On the other hand those who almost never go to church are more likely to choose the category “else” or the official view of the Catholic Church.

The results are quite similar when examining the regularity of praying or meditation. Those who pray regularly agree with God’s continuous presence in higher ratio than the ratio in the whole sample. The ratio of those is also high who believe that God created the world but then the laws of evolution do the rest, and relatively few people chose the category of “else” or the official view of the Church here. However among the respondents who almost never pray or meditate the ratio of those who select the category “else” or choose the official view of the Church is higher than in the whole sample. It is not characteristic of this group to accept God’s continuous presence or the deist position.

To sum up, we observe that religiosity relates to the way the students think about the reconcilability of the two theories in such a manner that the more contribution religiosity makes in a students’ everyday life, the more this student is likely to believe in God’s continuous presence, and vice versa: the less intensive the practice of religion, the more likely the student accepts the official view of the Church or to believe in something else. Our result suggests that for the deeply religious the position of the Church is of lesser importance than previously thought. On the other hand, the answer that both theories are true at their own level is attractive for the not-so-religious students not because it is the official point of view of the Church but because it is the easiest to accept without conflict. (This answer is the one that makes scientific researches the least problematic, as here science does not make a difference if one believes in God or not, and also, doing science is not influenced here by one’s religion.)

The emerging hypothesis seems to be supported by the following table as well, in which – again, reducing the sample to biologists only – answers were sorted by years. As there were not enough respondents we had to combine the years for analysis.

18. Table

How do you think the two concepts (evolution and creation) are reconcilable? \* How many years have you completed in the university?:

How do you think the two concepts are reconcilable?	How many years have you completed in the university?		Total
	One or two	Three or four	
Both of them are true in their own dimension, on their own level.	43 69,4%	19 30,6%	62 100,0%

God works inside the evolution directing it from within.	32 86,5%	5 13,5%	37 100,0%
God created the world, but then the laws of evolution work.	31 93,9%	2 6,1%	33 100,0%
Else	26 96,3%	1 3,7%	27 100,0%
Total	132 83,0%	27 17,0%	159 100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14,695	3	0,002

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V	0,304	0,002
		159	

Almost all seniors think that both theories are true in their own dimension or at their own level, against the juniors who preferred this answer less. It is likely that after being three or four years at the university spent with learning about evolution and with experiments in the laboratories, this solution is the one helping to avoid cognitive dissonance. For non-biology students the table was independent.

Students choosing the category of “else” had the possibility to express their own opinion in detail. Respondents usually did not want to give any alternative solution on how to reconcile the two ideas, but rather added some general remarks on the whole issue or expounded their own attitudes, or judged the pre-given answers to be loose – to give something similar but now in their own words. As it is very difficult to define types of answers here, we would rather like to show just a few examples.

Two students wrote that “*the theory of evolution can't give us all the answer yet*”; “*the truth will appear later*”. Two respondents are hesitating: “*I believe in evolution, but I do not preclude anything*”; and “*Creation doesn't prove the existence of God, but evolution, development had to start somehow*”. A girl on the contrary thinks that “*they justify a lot of things with the evolutionary theories just to avoid dealing with God, they don't want to realize who he is.*” Two boys responded that “*science answers the question of “how”, the Bible give answers to the question of “why”*”. Another two students think that each of us has to decide by oneself how we want to make the two theories consistent. According to five respondents evolution and the story of creation are the same, but the latter is “*speed up*” or “*the men of the ancient world wrote it down this way*”; “*as in that time philosophy was the most precise discipline among sciences and there were no proved facts about the origin of life, people needed to believe in something, that is how religions came into being, in which a parallel can be drawn between symbols and scientific facts.*” Four students called attention to the idea that “*God is not necessarily such as the Church shows him.*”; “*I can imagine that evolution doesn't happen such a way we learn about it, but some sort of external force “meddle” with it, but it is not necessarily the God, that appears in the Christian religions. I consider the whole concept ambiguous.*” Another three respondents believe that “*God created the world, and evolution is part of it.*” Other solutions: “*God influences the occurrence of any mutation*”; “*Everything happens according to God's will.*”; “*God's task is included in the laws of evolution.*”; “*God created the possibility of evolution. (Is God the physical laws?)*”. Finally, a very nice comment (much in the spirit of Darwin): “*If it is really God who created the world he couldn't do it better then by the way of evolution!*”

Although we expected answers given by the biology students to be more sophisticated, in fact there were no significant differences between responses of biology majors and other disciplines.

Thought about the relation between science and religion were provoked by an additional direct question.

19. Table

Do you think that science can substitute religion (can it give answer for the “big questions of life”)? (%)

Yes, I do.	22,8
No, I don't	61,3
I don't know.	10,4
I don't want to answer.	5,4
Total	100,0

Usually it is the religious students who think that science cannot substitute religion; meanwhile the non-religious students think it can:

20. Table

Do you think that science can substitute religion (can it give answer for the “big questions of life”)? \* Are you a religious person?

Do you think that science can substitute religion?	Are you a religious person?			Total
	Yes, I am.	No I am not.	In some respect.	
Yes, I do.	10 8,2%	73 59,8%	39 32,0%	122 100,0%
No, I don't.	170 49,3%	52 15,1%	123 35,7%	345 100,0%
I don't know.	12 21,8%	14 25,5%	29 52,7%	55 100,0%
Total	192 36,8%	139 26,6%	191 36,6%	522 100,0%

Chi-Square Tests

	Value	df.	Asymp. Sig. (2-sided)
Pearson Chi-Square	117,654	4	0,000

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V	0,336	0,000
		522	

We obtained quite a similar table when looking at the intensity of practicing religion, both in the case of the regularity of attending ceremonies and in the case of the regularity of praying. We show one of these.

21. Table

Do you think that science can substitute religion (can it give answer for the “big questions of life”)? \* Apart from weddings, funerals and christenings, about how often do you attend religious services?

Do you think that science can substitute religion?	How often do you attend religious services?			Total
	Regularly, min. once in a month	Rarely	Never, almost never	

Yes, I do.	8 6,3%	28 22,2%	90 71,4%	126 100,0%
No, I don't.	122 35,8%	103 30,2%	116 34,0%	341 100,0%
I don't know.	10 17,9%	13 23,2%	33 58,9%	56 100,0%
Total	140 26,8%	144 27,5%	239 45,7%	523 100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	64,760	4	0,000

Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V 0,249	0,000
	523	

### 3.3 INCONSISTENCY

Another aim was to examine the consistency of the students' thinking. One part of the questionnaire was put together just for testing this very issue. Seventeen questions were asked concerning evolution, some formulated in a religious, some in an atheist way. Analysis was reduced to biology students, because we assumed that they know the subject, while students of other majors may not have thought about these questions before. See first the "atheist" approaches.

22. Table  
Do you agree? (%)

	Yes, I do.	No, I don't.	I don't know.	I don't want to answer.	Total
1. There is no substantial difference between man and animal with respect of their origin and essence.	56	32,7	8,2	3,1	100,0
2. Every species including man is the result of biological evolution.	80,5	6,6	9,7	3,1	100,0
3. The dying out of species contradicts divine dispensation.	11,3	63,5	15,4	9,7	100,0
4. Evolutionary development is the outcome of several accidental events.	43,4	39,9	13,2	3,5	100,0
5. Living creatures' apparent expedience actually doesn't imply any goal or meaning.	12,9	67,6	14,8	4,7	100,0
6. The vestigial organs seem to be useless and meaningless according to the theory of independent creation.	18,6	39,3	35,5	6,6	100,0
7. Human life in itself can have a purpose.	74,8	14,8	8,2	2,2	100,0

We have received table not even remotely homogeneous. The strongest hesitation was seen with question 6 considering vestigial organs. Although this is one of the classical arguments of evolutionary controversy, students seem to be not able to apprehend or interpret it. So we left this question out of further analysis.

Results concerning the third and fifth statements were also surprising. Originally we assumed that non-religious students would agree with these statements, as opposed to the religious students who were expected to refuse them. There is indeed a significant difference

when evaluating these answers against the religiosity of the students, yet the reason of the unusual results lies mainly in the responses of non-religious students. Although they accepted the statement to a higher ratio than found in all respondents, yet in case of statement 3, a 52,8 percent of them, and in case of statement 5, a 51,3 percent of them disagreed. This ratio remained the unchanged with the years.

The third statement about the extinction of species was probably approached on a purely logical basis by the non-religious, that is, although they don't believe in divine dispensation, assume that "in a peculiar way it can work".

We can't refer to "logic" in case of statement 5. The assertion grasps one of the most important elements, or rather to say, the very essence of evolutionary theory. The refusal of the idea by the religious students is not truly surprising because it may sharply contradict their world view. But on what grounds do non-religious students refuse it? Our hypothesis is that maybe some old, deeply routed intellectual habits are at work in their thinking. Namely, in the ruling ideology of the Communist system (especially in the "drop-down forms of ideology", as in ground education, in the phrases and slogans, etc.), quite similarly to what is found in the religions, there was little room for accidents. Everything had a goal and a meaning, all of the time. Our result now shows that non-religious respondents either didn't understand evolutionary theory or they didn't want to understand it, and it seems that this fact can't be changed by the years spent at the university, as there was no difference found between the seniors and the juniors.

The result becomes even more spectacular when compared with the second statement: "Every species, including man is the result of biological evolution". This sentence, which has the "flavor of a textbook", was accepted by almost every student (80,5 percent). Although religious students are more likely to refuse this assertion as against their non-religious fellows, who usually tend to accept it, still the majority of religious students (exactly, 69,1 percent of them) agreed with it! At first sight, this is not a big contradiction, as some part of these students formed the group who thought evolution and creation were reconcilable theories. Yet the same problem is raised again in different words. How do students interpret evolution theory? Now let's have a look at typical religious arguments:

23. Table  
Do you agree? (%)

	Yes, I do.	No, I don't.	I don't know.	I don't want to answer.	Total
8. Evolution cannot explain the perfection and complexity of certain organs (e.g. the eye).	17,6	58,5	23,3	0,6	100,0
9. The theory of evolution cannot explain the origin of certain species.	31,1	42,8	23,9	2,2	100,0
10. The process of evolution has a goal and it follows a direction.	43,1	36,5	17,3	3,1	100,0
11. Studying nature means at the same time studying God.	24,2	48,7	17,9	9,1	100,0
12. Evolution moves toward spirituality.	4,4	47,5	41,2	6,9	100,0
13. The laws behind natural processes suggest a divine nature.	28,3	42,8	23,6	5,3	100,0
14. There is a being in the world that is responsible for the laws of evolution.	23	48,1	23,3	5,7	100,0
15. The direction and real purpose of evolution is nothing else but a final union with God.	7,5	55	30,8	6,6	100,0
16. The apparent order or coherence of the world embodies the nature of God.	23	46,5	24,2	6,3	100,0
17. A living organism can originate only from a living organism.	45,9	36,8	14,5	2,8	100,0

The table shows more homogeneity than the previous one. However, two statements don't fit into the line. Especially, this is the case with statement 12, that "The evolution moves toward spirituality". The majority of students apparently couldn't interpret the concept of "spirituality". Similarly, assertion 15 led to a strange result. It says: "The direction and real purpose of evolution is nothing else but a final union with God." While the atheist respondents probably "knew" that they had to answer "No" if they wanted to be self-consistent, religious students became uncertain. On the one hand, this may mean that they don't know the big theories of theology concerning evolution, theories that intend to integrate evolution into religion (e.g. Teilhard de Chardin). On the other hand, the concept of "union with God" could also be problematic to them.

The other responses show a roughly similar distribution. Yet the high ratio of uncertain respondents in all questions deserves attention. Who are these students? The above statements show a direct correlation with religiosity. Students considering themselves to be definitely religious usually agree with the above sentences, while the non-religious usually refuse them. On the other hand, respondents considering themselves religious in some respect are uncertain to a higher than average ratio. Probably they just don't know which of their world views to follow here: the religious or the scientific one. At the same time the same persons usually agreed with most of the "atheist" sentences of Table 22. (Except for two of them – statements 4 and 5 – where undecided students represented a higher ratio.) This taken together may indicate that those who are religious in some respect prefer a scientific world view after all, and they also shape their religiosity accordingly.

We tested some more statements that more or less expressed the same ideas, sometimes only in different words, but sometimes with an opposite sign. It is worth comparing how students answer to these questions. How consistent is their thinking? Below we present three tables by way of illustration.

24. Table

Every species including man are the results of biological evolution. \* The theory of evolution cannot explain the origin of certain species.

Every species including man is the result of biological evolution.	The theory of evolution can not explain the origin of certain species.			Total
	Yes	No	I don't know	
Yes, I agree.	72 28,6%	120 47,6%	60 23,8%	252 100,0%
No, I don't agree.	14 66,7%	4 19,0%	3 14,3%	21 100,0%
I don't know.	9 30,0%	9 30,0%	12 40,0%	30 100,0%
Total	95 31,4%	133 43,9%	75 24,8%	303 100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17,899	4	0,001

Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V	0,172	0,001
		303	

Only a weak relation is obtained between the above two sentences. This should be astonishing, as the two arguments are roughly opposite to each other, so a much clearer relation could be expected. Nevertheless we can see that those who think that “*every species including man is the result of biological evolution*” do not agree with the assertion that “*the theory of evolution cannot explain the origin of certain species*” to a higher ratio than the average. At the same time, those who accept that “*the theory of evolution cannot explain the origin of certain species*” refuse the assertion that “*every species including man is the result of biological evolution*” to a higher ratio than the average. It also deserves attention that we found 72 students (among them 61 juniors) who agreed with both sentences, that is, they appear to think both that every species are the results of biological evolution and at the same time that the theory of evolution can’t explain the origin of every species.

A similar inconsistency appears when comparing statements 4 and 10.

25. Table

The process of evolution has a goal and follows a direction. \* Evolutionary development is the outcome of several accidental events.

The process of evolution has a goal and follows a direction.	Evolutionary development is the outcome of several accidental events.			Total
	Yes	No	I don't know.	
Yes, I agree.	52 39,1%	62 46,6%	19 14,3%	133 100,0%
No, I don't agree.	69 62,7%	36 32,7%	5 4,5%	110 100,0%
I don't know.	16 29,6%	21 38,9%	17 31,5%	54 100,0%
Total	137 46,1%	119 40,1%	41 13,8%	297 100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33,180	4	0,000

Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V 0,236	0,000
	297	

A mid-strong relation appears, which shows that those who think “*evolutionary development is the outcome of several accidental events*” refuse the statement that “*the process of evolution has a goal and follows a direction*” in a higher ratio than the average and vice versa: those who don’t agree with the first statement usually do agree with the second. Yet there are 52 students among the 297 respondents who can agree with both assertions. That is, they think that “*the process of evolution has a goal and follows a direction*” and at the same time also believe that “*evolutionary development is the outcome of several accidental events*”. In this respect, there is no difference between the juniors and the seniors. Every sixth student in both groups accepted both sentences. But what opinion may those 36 respondents hold about evolution who did not agree with any of the two statements?

The following results comparing statements 5 and 6 are also difficult to interpret.

26. Table

Living creatures' apparent expedience actually doesn't imply any goal or meaning. \* The process of evolution has a goal and follows a direction.

Living creatures' apparent expedience actually doesn't imply any goal or meaning.	The process of evolution has a goal and follows a direction.			Total
	Yes	No	I don't know.	
Yes, I agree.	14 34,1%	22 53,7%	5 12,2%	41 100,0%
No, I don't agree.	103 49,5%	72 34,6%	33 15,9%	208 100,0%
I don't know.	15 31,9%	16 34,0%	16 34,0%	47 100,0%
Total	132 44,6%	110 37,2%	54 18,2%	296 100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15,215	4	0,004

Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal N of Valid Cases	Cramer's V 0,160	0,004
	296	

Those who think that *“the process of evolution has a goal and follows a direction”* refuse the statement that *“living creatures' apparent expedience actually doesn't imply any goal or meaning”* in a higher ratio than the average. Meanwhile, those who think that *“living creatures' apparent expedience actually doesn't imply any goal or meaning”* refuse the statement that *“the process of evolution has a goal and follows a direction”* in a higher ratio than the average. However, again, there were 14 students who agreed with both sentences, that is, they really think *“living creatures' apparent expedience actually doesn't have any goal or meaning”* and they also think that *“the process of evolution has a goal and follows a direction”*. But what kind of goal and direction could the process of evolution follow according to them that does not appear to be manifested in the living beings?

It is no less puzzling what those 72 students of biology may think who didn't agree with any of the above two statements. They think that living creatures have goals or meaning but at the same time the process of evolution does not follow any direction. Did a religious world view underlie their answers? Contradicting to this idea, not all of them are religious. Among the 72 students there are only 21 with deep religiosity, 35 of them are religious only in some respect, and the remaining 13 respondents are not religious at all.

Perhaps a more reliable explanation is that the concept of “goal” or “expedience” presents a problem again. It looks as if, independently of both evolution and of religion, the majority of the students would prefer to believe that natural or physical processes (including evolution), and therefore each and every living being has a goal, meaning or direction. So maybe the students' way of thinking and their entire world view is characterized by purposefulness, or we can say, a kind of teleological attitude. Purposefulness and consequently a kind of goal-oriented rationality may be more acceptable for them than pure contingency – which after all means a form of irrationality to most people. Therefore the idea of evolution in its original, pure, scientific form seems to be hard to digest, even for the students of biology.

#### 4. CONCLUSIONS

The examined data led to the surprising conclusion that religiosity is an important factor with respect to only certain questions concerning the students' attitudes towards the theory of evolution. Religious students tend to possess a basic knowledge concerning biological evolution, and seldom follow (fundamentalist) religious theories and arguments in their answers – also, it appears that they tend to listen to scientific arguments. Inconsistency of replies is an important problem in both religious and non-religious students. Finally, and most surprisingly, the issue of reconciliation of evolution and creation theories is more of a problem for the non-religious, whereas the religious students may have already found their way to circumvent this problem.

Another kind of conclusion that can be drawn from our analysis points attention to an important methodological question. How can specific items of scientific knowledge be tested in a wider community? Is it testable at all, for instance, how well a given scientific theory is understood, how much of it is accepted, or what parts of it make it to the wider public? Or, more precisely, is it all testable with a questionnaire? A serious problem is presented by the difficulty of drawing limits. How much intellectual depth or how thorough an understanding can or should be expected? Shall a test be based on canonical, „textbook-like” formulations? If so, there is a danger of administering a memory test rather than gaining feedback on deep personal attitudes or all-penetrating, well-digested bits of knowledge. Even textbooks tend to deal with different questions in different depth. And there are several truly scientific problems – especially in evolution – for which a layperson using common sense and logic can think up a solution, which then either agrees or disagrees with the response learned from a basic introductory textbook – and textbook knowledge does not necessarily agree with the modern standpoint of frontline research, which is based on professional debate. In a questionnaire like this, it is very difficult to know who says what why. It is difficult to know if the responder knows less, or more, than the canonical simplification, e.g. when talking about the role and importance of „randomness” in evolution. Which response do we get, one based on common belief, one remembered from a textbook, or one read in a frontline publication? Or do we get the respondent's personal „opinion”?

The survey has some significance beyond the issue of the evolution vs. religion controversy as it questions the existence of independent human thinking in issues like the one tested here. The respondents seemed to prefer thinking in commonplaces, conventional patterns, stereotypes, and unquestionable clichés originated from schooling, common knowledge, and family traditions etc. The habitual aspect of the respondents' thinking may be an explanation for the inconsistencies and contradictions we found. It is also possible that these results proceeded from incomplete and dynamically forming personalities and that the world views of the respondents were relatively premature. Or it is also possible that the results represent a contingency and inconsistency of the ordinary person's thinking. To approach these various interpretations, further studies would be necessary.

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## REFERENCES

- MCGRATH, A.E. (1999): *Science and Religion. An Introduction*. Blackwell, New York.
- DARWIN, C. (1859): *On the origin of Species by Means of Natural Selection*.
- DARWIN, C. (1871): *The Descent of Man, and Selection in Relation to Sex*.
- FARKAS, A. M. (1998): *Buddhizmus Magyarországon, avagy az alternatív vallásosság egy típusának anatómiája*. (Buddhism in Hungary, or the anatomy of a type of alternative religiosity.) MTA PTI Etnoregionális Kutatóközpont Munkafüzetek 50. Budapest.
- TOMKA, M. (1999): *A magyar vallási helyzet öt dimenziója*. (Five dimension of the Hungarian religious situation) In: *Magyar Tudomány* 1999.5. 552-553.

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