

科学と宗教 I (1939)

1939年5月19日、プリンストン神学校におけるアメリカ神学校連合会東北部会での演説

知識と信仰との紛争の時代 前世紀および前々世紀のある時期にあっては、知識と信仰とのあいだに宥和しえない紛争が存在する、と広く考えられていました。今こそ、ますます信仰が知識にとってかわられねばならぬ時代だ、知識に基づかない信仰は迷信であり、そのような信仰は反対すべきである、といった意見が、頭の進んだ人々のあいだにひろまっていた。この考え方によれば、教育の唯一の機能は、思惟と知識獲得との道を開くことであり、人々の顕著な教育機関である学校は、その目的にのみ奉仕すべきである、ということになったのです。

今後はおそらく、このような粗野な形で表明された合理的立場を、ほとんど見いだすことはないでしょう。なぜなら、少しでも物のわかった人なら、合理的立場をこのように扱うことが、どれほど一方的なものであるか、ただちに理解できるからです。しかし合理主義の性質に関して見解を明らかにしたいという人があれば、あからさまにある主張を述べてみるのもいいことでしょう。

合理的立場の弱点 確信は、経験と明晰な思惟によってもっともよく支持される、というのは本当です。この点では、極端な合理主義者の主張に、はばかりとなく賛成しなければなりません。しかし彼らの考え方の弱点は、次の点にあるのです。すなわち、我々の行為や判断に必要であり、またその基準となるさまざまな確信は、その堅固な科学的方法によってのみ見いだしうるものではない点です。

というのは科学的方法は、諸事実が相互にどのように関係し合っているか、また相互にどのように条件付けられているか、ということ以上には何物をも教えることができないからです。このような客観的知識へ向かうとする熱意は、人間のなしうる最高のことに属していますし、皆さん方も、この分野における人間の成果や英雄的努力を、私が軽んじようとしているとは決してお考えにならないでしょう。しかし等しく明瞭なことなのですが、これこれであるという知識は、これこれであるべきだ、ということへ直接通じる扉を開いてはくれないのです。こうこうであるということの知識を、いくら明瞭に完全にもつことができても、人間の願望の目標であるべきかを、それから演繹することはできないのです。客観的な知識は、ある種の目的を達成するための、強力な道具を提供してはくれますが、究極的な目標そのもの、およびそれに到達しようとする憧れは、他の源泉から生まれねばなりません。また論ずるまでもないことなのですが、我々の生存や活動は、そのような目的に相応する諸価値を設定して初めて意味を持つことができるのです。真理そのものの知識は、すばらしいものではありませんが、それは案内人の働きをほとんどすることができないので、真理の知識そのものへ向かう熱意の正当さ、およびその価値をさえ証明することができません。したがってここで我々は、我々の存在に関する純粋に合理的な概念の限界に達するのです。

知的な思惟の目的達成への寄与と宗教の機能 しかし知的な思惟が、目標や倫理的判断の形式に、なんらの役割も演じえないのだ、と仮定してはなりません。ある目的を達成するために、ある手段が有効である、と誰かが悟れば、その手段そのものがそれで一つの目的となります。知性は、手段と目的との相関関係を、われわれに明らかにしてくれます。しかし思惟だけでは、究極的で根本的な目的感覚をわれわれに与えることはできません。その根本的な目的と価値判断とを明らかにし、それを個人の感情的生活にしっかりと根を下ろさせることこそ、人間の社会生活にあって、まさに宗教が果たすべきもっとも重要な機能だと私には思えます。そのように根本的な目的の權威は、理性だけで述べたり正当化したりできない以上、その權威はいったいどこからくるのか、と尋ねる人があれば、次のようにしか答えられないのです。つまりそれは健全な社会において、強力な伝統として存在していて、諸個人の行為や抱負、判断の上に働きかけるのであり、またそれは生ける何物かとして、存在の正当化を見いだす必要のない何物かとして、そこにあるのですから、と。それは証明によってもたらせるものではなく、啓示によって、力強い人格の媒体を通じて、存在にまでもちきたらされます。人々はそれを正当化しようと試みるべきではなく、むしろ単純に、明瞭に、明晰にその性質を感じ取ろうとすべきです。

宗教の目標 我々の抱負との最高の原理は、ユダヤ・キリスト教の宗教的伝統の中にあたえられています。それはきわめて高度の目標であるために、我々が弱い力を持ってしては、ごく不完全にしか到達できないものです。しかしそれは、我々の抱負や価値判断にたいして、確実な基礎を与えています。その目標を宗教的形式の中からとりだし、純粋に人間的な側面だけを眺めうるとすれば、おそらく次のように言うことができるでしょう。個人を自由に、そして責任ある発展をさせ、その結果、個人が諸能力を、全人類のために自由に喜んで奉仕させるようにすることです。

ここには、国家や階級の神格化の余地はなく、いわんや個人の神格化も存在していません。宗教的言語が語っているように、我々はすべて一人の父の子供たちではないのでしょうか？ 抽象的全体としての人類の神格化でさえ、まさにその理想の精神にはそわないものでしょう。魂が与えられているのは、個人に対してだけです。そして個人の高邁な運命は、支配したり、あるいはなんらか他のやり方で自己を押しつけることよりも、むしろ奉仕することにあるのです。

現代の危機 もし、人々が、形式よりも実質をみつめるとすれば、以上の言葉がまた、基本的な民主的立場を表明しているものと考えられます。我々の使っている意味で宗教的な人が、自分の属している国家を決して崇拜しないのと同様に、真の民主主義者もまた、自分の国家を崇拜しないことができるのです。

それではこの場合、教育や学校の機能はどのようなものとなるのでしょうか？ その基本的な原理が、自ら呼吸する空気と同様に感じられる。といった精神で青年たちが成長していくように、教育は役立たねばなりません。授業だけでは、それを成し遂げることは不可能です。

もし人々が高度の原理を、明瞭に眼の前に置いて、それと現代の生活や精神とを比較してみますと、文明化された人類が現在、重大な危機にあることがまばゆいばかりにわかるでしょう。全体主義的諸国家においては、人間性の精神を実際に破壊しようと努めているのは、支配者自身なのです。まだそれほど脅威にさらされていない国々では、そのもっとも貴重な伝統を閉塞させようとしているのは、国家主義と頑迷、また経済的手段による個人的抑圧なのです。

しかしその危機がどれほど大きいものか、という覚醒は、思考力のある人々のあいだに拡まりつつあります。そしてその危機に対処するための手段——国内および国際政治、立法、組織の一般の諸分野においける手段——が旺盛に探求されてもいます。そのような努力は、疑いもなくきわめて必要です。しかし古代人たちは、我々が忘れてしまったように思える何物かを、知っていました。あらゆる手段も、その背景に生きた精神がなければ、鈍い道具にしかすぎません。しかし自然達成への憧れが、われわれの内に力強く生きていけば、その目標へ到達し、またそれを行為にうつさせる手段を見いだす力に、決して欠けることはないであります。

科学と宗教 II (1941)

Science, Philosophy and Religion, a Symposium; published by the Conference on Science, Philosophy and Religion in Their Relation to the Democratic Way of Life, Inc., New York, 1941 へ寄稿されたもの。

科学とは・宗教とは 科学とは何か、という点で意見の一致に到達することは、困難ではないであります。科学とは、組織的な思索を展開して、この世界の知覚しうる諸現象を、できるかぎり徹底的な一つの連合にもちきたそうとする、数世紀を年経た努力なのです。大胆な言い方をしますと、科学とは、概念化という過程によって、後から存在を再建しようとする試みであります。しかし宗教とは何か、と自問してみますと、私には容易にその答えを思いつけません。そして現在のこの瞬間に、私を満足させるような答えを見いだした後にも、なお私は次のように確信しつづけるでしょう。すなわち、この問題を真剣に考えたすべての人々を、些少ともある点で意見の一致を見させることは、どのような状況においても、私にはけっしてできないことだ、と。

宗教的人格 それで、まず、初めに、宗教とは何かを問うかわりに、私に宗教的だという印象を与える人がもっている抱負には、どのような特徴があるか、という問いを発するべきでしょう。宗教的に啓発された人格とは、私には次のようなものに思えます。つまり自己の能力のあたらかぎり、自的欲の拘束から自らを解き放ち、超個人的な価値のために執着している思想、感情、抱負に余念が無い人なのです。重要なのは、この超個人的内容の力強さと、その圧倒的な意義に対する確信の深さであると私には思えます。この場合、その内容を神と結びつける試みがなされているかどうかは、問題ではありません。そうでなければ、仏陀やスピノザを、宗教的人格とみなすことは不可能になります。したがって、宗教

的な人は、次のような意味で敬虔なのです。つまり合理的な基礎を必要とせず、またその基礎もありえない超個人的対象や、目標の意義と高貴さにいさかきも疑いを抱いていない、という意味なのです。

宗教と科学の違い その対象や目標は、その人自身と同じ必然性と自明性をもって存在しています。この意味で宗教とは、これらの価値や目標を明瞭に完全に意識し、その効果を間断なく強化し、拡大しようとする人類の年経た努力なのです。もし人々が、この定義にしたがって宗教と科学とを考えるならば、その両者に紛争があるなどは、不可能なことに思えるでしょう。なぜなら科学は、こうあるべきだということではなくて、こうであるということを確認するにすぎないし、科学の領域外では、あらゆる種類の価値判断が依然として必要だからです。それに反して宗教は、人間の思想と行動との評価のみを問題とします。宗教は、事実や事実間の関係について、正当に語ることはできません。この解釈に従えば、過去において宗教と科学とのあいだに周知の紛争があったことは、すべて今述べた事態の誤解に起因することになります。

例えば、聖書に記されたあらゆる言明が、絶対に真実であるといったことを、宗教社会が主張するような場合には、紛争が起こるのです。それは、宗教の側が科学の領域に干渉したことを意味します。ガリレオやダーウィンの説に反対して、教会が闘争した事実は、この部類に属しています。他方、科学を代表する人々は、科学的方法の基礎に立って、価値や目的に関する根本的な判断に到達しようとする、しばしば試みてきましたし、またそうすることによって、自ら宗教に反対してきたのです。これらの紛争すべては、致命的な誤謬から派生したものです。

相互依存性 さて宗教と科学の二領域は、それ自身では相互に明瞭な区別があるものなのですが、それにもかかわらず、その両者の間には、強い相互関係と相互依存性が存在します。宗教は目標を決定するものではありませんが、それが設定した目標達成に、どのような手段が役立つかということをもっとも広い意味で科学から学びました。しかし科学は、真理と理解に対する熱望を徹底していただいている人々によってのみ創造されます。しかしその感情の源泉は、宗教の分野から派生するのです。存在の世界に妥当する諸規則は合理的である、すなわち理性によって理解しうるのだ、という可能性への信仰もまた、宗教の分野に属します。私には、この深い信仰をもたない真の科学者を、考えることができないのです。この事態は、ある物象で表現し得ましょう。すなわち、宗教なき科学はびっこであり、科学なき宗教はめくらなのです。

全能で正義の人格神という存在の矛盾 本当は、宗教と科学のあいだには、正当な争いは存在しない、と私は主張しましたが、ふたたびある重要な点について、歴史的宗教の実際の内容に関連させて、その主張の根拠を述べなければなりません。それは、神という概念に関したことです。人類の精神的進化が未熟だった時期に、人間の空想力は人間の像をもつ神々を創造しました。その神々

は、自らの意志を働かせて、現象の世界を決定したり、あるいはそれに影響をあたえるものと考えられたのです。人間はその神々の気質を、呪術や祈祷によって思い通りに変えようとしてきました。現在説かれている諸宗教における神の観念は、この神々という古い概念の昇華したものです。その擬人的な性格は、例えば人々が、祈りの中で神に訴えたり、自分の願望をかなえて下さいと嘆願する事実を示されています。

あまねく恩恵を垂れ、全能で正義の人格神が存在するという観念が、人間に慰め、助力、導きを与えることを、確かに誰も否定しようとはしないでしょう。またその観念が単純なために、それはどんなに蒙昧な人々にも近づきやすいのです。しかし一方、その観念自身には、決定的な欠点があつています。それは歴史が始まって以来、痛ましくも感じられてきた欠点なのです。それは、もし神が全能であれば、あらゆる人間の行動、思想、感情、抱負をも含めたすべての出来事が、やはり神のみ業であるということになり、そうだとすれば、そのような全能の存在の前に、人間が自らの行為や思想に責任を負わねばならないとは、どうして考えることができるのでしょうか？ 神が処罰や報償を行われる時には、ある程度まで神は、自分自身に審判を下していることになりましょう。このようなことは、神に帰せられている善良と正義ということと、どうして宥和させることができるのでしょうか？

科学的諸法則 宗教と科学の二領域間にみられる現在の紛糾の主源泉は、この人格神という概念にあるのです。時間と空間における対象と出来事との、相互関係を決定する一般的諸規則を確立するのは、科学の目的です。その諸規則、つまり自然の諸法則には、絶対に一般的な妥当性が要求されます。がそれは証明されはしないのです。それは一つの綱領であり、原理的にそれが成就される可能性への信仰は、部分的な成功に基づいているにすぎません。しかしその部分的成功を否定し、その成功を人間の自己欺瞞のせいにする人は、おそらくいないことでしょう。たとえ人間が、そのような諸法則の内容を、ごく少ししか把握していないとしても、その諸法則を基礎として、我々がある領域の諸現象の一時的あり方を、非常な精密さと確実さで予測することができる事実は、近代人の意識の中に深く根をはっています。太陽系に属するさまざまな惑星の軌道が、ある限られた数の簡単な法則を基礎として、非常な精密さであらわじめ計算しうることを、考えてみれば足りるでしょう。同じ精密さではないとしても、やはり同様に、電動機や送電系統、あるいは無線装置などの作動状態を、それが新しく作られつつある時期においてさえ、あらかじめ計算することが可能なのです。

確かに、ある現象複合体に作用している因子の数が多すぎるときには、たいていの場合、科学的な方法は失敗します。数日先の天気予報でさえ、不可能であることを考えれば、それがわかるでしょう。それにもかかわらず、われわれの対決しているものが、因果的諸要因が大部分既知であるところの、ある因果的関連であることを疑う人はいないのです。天候という分野におけるさまざまな出来事は、精密な予測の埒（らち）外にあります。なぜならそれは、自然に秩序が欠けているからではなく、作

用している諸因子が種々雑多であるからです。

我々は、生物の領域に作用している諸規則性を、はるかに少ししか洞察していないのですが、それに関する我々の知識は、少なくともある明確な必然性が支配していると感じるには充分なのです。遺伝における組織的な秩序や、例えばアルコールといった毒物が、有機体の行動に及ぼす効果を考えてみれば足りるでしょう。この領域でまだ欠如しているのは、秩序そのものの知識ではなくて、該博な一般性をもった関連の把握なのです。

秩序ある規則性をもたない領域？ あらゆる出来事の秩序ある規則性をより多く感じれば感じるほど、異なった性質の諸原理からこの秩序ある規則性をもたない、といった領域は存在しないという確信はますます強固になります。この確信をもった人にとっては自然の出来事の独立した原因としての人間の支配、あるいは神の支配、というものは存在しないでしょう。確かに人格神が自然の出来事に干渉しているという教義は、科学によって真の意味で反駁されたことはけっしてありません。というのはその教義は、科学的知識がまだ足をふみいれなかった諸領域へ、つねに避難することができるからなのです。

しかし宗教を代表する人々のそういった態度は、無価値なものであるばかりではなく、また致命的なものでもであると私は考えています。なぜなら明るい光の下ではなく、暗がりの中においてのみ自らを主張しようとする教義は、必然的に人類に対する効果を失い、人間の進歩に測り知れない害毒を及ぼすだろうからです。倫理的善を目指して闘っている宗教の教師たちは、人格心の教義を放棄する度量をもつべきです。つまり過去に僧侶たちの手に、巨大な権力をもたらした恐怖と希望との源泉を、放棄するのです。そして彼らは、人間性そのものにおける、真、善、美を育成しうるさまざまな力を、自らの職分として活用しなければなりません。これは、確かにより困難な仕事ですが、また比較にならないほどもっとやりがいのある任務なのです¹。宗教の教師たちは、この純化過程を完成した後には、真の宗教が科学的知識によって高貴にされ、またより深められたことを、歓喜とともに、承認するでありましょう。

科学の宗教の目的への寄与 自己中心的な執着、欲望、恐怖の絆から、できるかぎり人類を解放することが、宗教の目標の一つであるとすれば、科学的推理はまた別の意味で、宗教を助けることができます。諸事実間の関連を許容し、またそれを予測する諸規則を発見することが、科学の目標であるのは本当ですが、それが唯一の目標なのではありません。科学はまた、発見された諸関連を、相互に独立したできるだけ少ない数の概念的要素に還元しようとしています。多岐にわたるものを合理的に統一しようとする試みは、まさに科学をして、幻影の捕囚となる危険を犯さしめるのですが、またそのような努力によって、科学はもっとも偉大な成功を勝ち得たのであります。しかし科学の領域において、立派な進歩をなしたげた強烈な経験をもつすべての人々は、存在の中に明らかにされた合理性に対して、深い畏敬をいだくものなの

¹ハーバード・サムエル (Harbert Samuel) の著書「信仰と行動」(Belief and Action) のなかには、これと同じ考えが確信をもって述べられています。

です。理解を通じて、そのような人々は、個人的願望や要求の足かせから、遠く自らを解放し、またそうすることによって、存在の中に具現している合理性の荘厳さ、もっとも深遠な深みにおいては、人間には近づくことができない壮麗さ一に対して、謙虚な態度をとるにいたるのです。しかしこの態度は、私にとって、もっとも高い意味における宗教における宗教的なものに思えます。したがってまた私には、科学は擬人的神観という不純物から宗教的衝動を純化するばかりではなく、さらに我々の人生理解を宗教的に高貴ならしめるということに貢献する、と思えるのです。

人間の精神的進化が進めば進むほど、真の宗教性への路は、生や死に対する恐怖とか盲目的信仰に通じているのではなく、合理的知識への努力に通じていることが、ますます確実となるように思われます。この意味で私は、僧侶が自らの高邁な教育的使命を果たそうとするならば、教師にならなくてはならないと信じています。

アインシュタイン

- 1879年3月14日、ドイツ・ウルム市に生まれる。
- 1896年スイス連邦工科大学入学。1902年、スイス特許局技官に。
- 1905年25歳にて発表した論文（三大論文：『光量子仮説』『ブラウン運動理論』『特殊相対性理論』Annalen der Physik 誌(17号)）が世界を驚かせた。
- 1916年、ドイツ・ベルリン大学教授時代に「一般相対性理論」完成。
- 1922年、ノーベル物理学賞受賞、来日。
- 1933年ヒトラー政権成立の年、ナチによる迫害を逃れ米国へ。プリンストン高級研究所などで研究生活を送る。第二次世界大戦ののち、自己の理論が、マンハッタン計画、原子爆弾へとつながったことを重く考え、科学の平和利用ための言論も行う。
- 1955年4月13日、以前から分かっていた腹部大動脈瘤が破裂し出血が始まったが手術拒否。1955年4月18日、プリンストン病院で死去。享年76歳。

HatenaKeyword から改編

アインシュタインと信仰 [3]

西島和彦（にしじま かずひこ）仁科記念財団

アインシュタインは1879年にドイツのウルムでユダヤ教信者の両親から生まれた。生まれて間もなく一家はミュンヘンに移り、彼はここで初等中等教育を受ける事となった。1886年に入学したミュンヘンの国民学校では宗教教育が義務であったので、彼は家族からユダヤ教の教育を受けた。1888年にレイポルト・ギムナジウムに入学してからは校長から宗教教育を受ける事になった。彼は当時ユダヤ教の熱心な信者になり、その教えに忠実であった。

しかしながら色々な科学の本に親しむようになると、彼は科学の教えるところと聖書の記述との間の矛盾に気が付き悩むようになり、その結果、遂にユダヤ教の堅信礼

を受ける事がなかった。その後、スイスの連邦工科大学に進学して物理学専攻を修了するが、暫くは就職探しに苦労した。しかし1901年にスイス国籍を取得し、更に1902年に特許局に就職して生活が安定すると徐々に彼の本領が発揮されるようになり、1905年に奇跡の年を迎えた。この年、彼は無名の青年から突如として世紀の天才へと変身したのである。この時、彼の身に何が起きたのかは我々の窺い知るところではないが、モーゼがシナイ山で神の声を聞いた時の様に、自然の秘密を無意識のうちに神から暗示されたのではないであろうか。多分この時から彼はユダヤ教を越えて、自然法則の背後にある彼自身の神を信じる様になったように思われる。それ以後の彼にとって科学と宗教との矛盾は消滅したのであろうか、彼は後に「宗教なき科学は不具であり、科学なき宗教は盲目である」と言っている。

その後、彼はユダヤ教に戻る事はなかったが、自分がユダヤ人であるという事を自覚する多くの機会があった。例えば、プラハ大学の教授に就任するに当たって信仰する宗教を申告しなければならなかったが、彼はそれをユダヤ教とはせずにモーゼの信仰とした。これは考え様によっては、上述の彼自身の新しい信仰を表したともとれるし、ユダヤ教と書く事を避けたとも考えられる。また、相対論はナチスによってユダヤ人の物理学として排斥され、彼等は相対論抜きドイツ物理学を導入したぐらいであるから、彼にとって1920年代は大変に辛く危険な時代であったと思われる。1922年の日本訪問もこの時代の危険を避ける為の旅行であった。

相対論の時代から徐々に量子論の時代に移ってくると彼の立場には少しずつ変化が生じる様になってくる。量子論の確率的解釈が彼の意に染まず、神がサイコロを振る事はないと、量子論のコペンハーゲン解釈を拒否する。科学と信仰との間のウエイトが年齢と共に前者から後者へと移行してゆくのが見て取れる。またこの様な対比は、科学と信仰の間だけでなく、科学と倫理或いは社会との間にも見られる。1934年に彼がルーズベルトに書いた手紙がきっかけとなって原爆が出来て広島と長崎に落とされた事を後悔して、この次に生まれる時には物理学者ではなくて鉛管工になりたいと言っている。

1955年4月18日にアインシュタインが亡くなると遺体は即日火葬され、その灰は人知れず撒かれた。宇宙全体を自分の墓地と考える彼に最もふさわしい葬られ方であった。

References

- [1] Albert Einstein on: Religion and Science:
<http://www.sacred-texts.com/aor/einstein/einsci.htm>
in Internet Sacred Text Archive:
<http://www.sacred-texts.com/aor/index.htm>
- [2] アインシュタイン著「晩年に思う」中村誠太郎・南部陽一郎・市井三郎訳、講談社文庫
- [3] 西島和彦「アインシュタインと信仰」岩波書店「科学」2005年3月号巻頭言
- [4] 加藤 知「科学と宗教」講義スライド：<http://sci-tech.ksc.kwansei.ac.jp/~skato/lecture.html>

Religion and Science

The following article by Albert Einstein appeared in the New York Times Magazine on November 9, 1930 pp 1-4. It has been reprinted in Ideas and Opinions, Crown Publishers, Inc. 1954, pp 36 - 40. It also appears in Einstein's book The World as I See It, Philosophical Library, New York, 1949, pp. 24 - 28.

Everything that the human race has done and thought is concerned with the satisfaction of deeply felt needs and the assuagement of pain. One has to keep this constantly in mind if one wishes to understand spiritual movements and their development. Feeling and longing are the motive force behind all human endeavor and human creation, in however exalted a guise the latter may present themselves to us. Now what are the feelings and needs that have led men to religious thought and belief in the widest sense of the words? A little consideration will suffice to show us that the most varying emotions preside over the birth of religious thought and experience. With primitive man it is above all fear that evokes religious notions - fear of hunger, wild beasts, sickness, death. Since at this stage of existence understanding of causal connections is usually poorly developed, the human mind creates illusory beings more or less analogous to itself on whose wills and actions these fearful happenings depend. Thus one tries to secure the favor of these beings by carrying out actions and offering sacrifices which, according to the tradition handed down from generation to generation, propitiate them or make them well disposed toward a mortal. In this sense I am speaking of a religion of fear. This, though not created, is in an important degree stabilized by the formation of a special priestly caste which sets itself up as a mediator between the people and the beings they fear, and erects a hegemony on this basis. In many cases a leader or ruler or a privileged class whose position rests on other factors combines priestly functions with its secular authority in order to make the latter more secure; or the political rulers and the priestly caste make common cause in their own interests.

The social impulses are another source of the crystallization of religion. Fathers and mothers and the leaders of larger human communities are mortal and fallible. The desire for guidance, love, and support prompts men to form the social or moral conception of God. This is the God of Providence, who protects, disposes, rewards, and punishes; the God who, according to the limits of the believer's outlook, loves and cherishes the life of the tribe or of the human race, or even or life itself; the comforter in sorrow and unsatisfied longing; he who preserves the souls of the dead. This is the social or moral conception of God.

The Jewish scriptures admirably illustrate the development from the religion of fear to moral religion, a development continued in the New Testament. The

religions of all civilized peoples, especially the peoples of the Orient, are primarily moral religions. The development from a religion of fear to moral religion is a great step in peoples' lives. And yet, that primitive religions are based entirely on fear and the religions of civilized peoples purely on morality is a prejudice against which we must be on our guard. The truth is that all religions are a varying blend of both types, with this differentiation: that on the higher levels of social life the religion of morality predominates.

Common to all these types is the anthropomorphic character of their conception of God. In general, only individuals of exceptional endowments, and exceptionally high-minded communities, rise to any considerable extent above this level. But there is a third stage of religious experience which belongs to all of them, even though it is rarely found in a pure form: I shall call it cosmic religious feeling. It is very difficult to elucidate this feeling to anyone who is entirely without it, especially as there is no anthropomorphic conception of God corresponding to it.

The individual feels the futility of human desires and aims and the sublimity and marvelous order which reveal themselves both in nature and in the world of thought. Individual existence impresses him as a sort of prison and he wants to experience the universe as a single significant whole. The beginnings of cosmic religious feeling already appear at an early stage of development, e.g., in many of the Psalms of David and in some of the Prophets. Buddhism, as we have learned especially from the wonderful writings of Schopenhauer, contains a much stronger element of this.

The religious geniuses of all ages have been distinguished by this kind of religious feeling, which knows no dogma and no God conceived in man's image; so that there can be no church whose central teachings are based on it. Hence it is precisely among the heretics of every age that we find men who were filled with this highest kind of religious feeling and were in many cases regarded by their contemporaries as atheists, sometimes also as saints. Looked at in this light, men like Democritus, Francis of Assisi, and Spinoza are closely akin to one another.

How can cosmic religious feeling be communicated from one person to another, if it can give rise to no definite notion of a God and no theology? In my view, it is the most important function of art and science to awaken this feeling and keep it alive in those who are receptive to it.

We thus arrive at a conception of the relation of science to religion very different from the usual one. When one views the matter historically, one is inclined to look upon science and religion as irreconcilable antagonists, and for a very obvious reason. The man who is thoroughly convinced of the universal operation of the law of causation cannot for a moment entertain

the idea of a being who interferes in the course of events - provided, of course, that he takes the hypothesis of causality really seriously. He has no use for the religion of fear and equally little for social or moral religion. A God who rewards and punishes is inconceivable to him for the simple reason that a man's actions are determined by necessity, external and internal, so that in God's eyes he cannot be responsible, any more than an inanimate object is responsible for the motions it undergoes. Science has therefore been charged with undermining morality, but the charge is unjust. A man's ethical behavior should be based effectually on sympathy, education, and social ties and needs; no religious basis is necessary. Man would indeed be in a poor way if he had to be restrained by fear of punishment and hopes of reward after death.

It is therefore easy to see why the churches have always fought science and persecuted its devotees. On the other hand, I maintain that the cosmic religious feeling is the strongest and noblest motive for scientific research. Only those who realize the immense efforts and, above all, the devotion without which pioneer work in theoretical science cannot be achieved are able to grasp the strength of the emotion out of which alone such work, remote as it is from the immediate realities of life, can issue. What a deep conviction of the rationality of the universe and what a yearning to understand, were it but a feeble reflection of the mind revealed in this world, Kepler and Newton must have had to enable them to spend years of solitary labor in disentangling the principles of celestial mechanics! Those whose acquaintance with scientific research is derived chiefly from its practical results easily develop a completely false notion of the mentality of the men who, surrounded by a skeptical world, have shown the way to kindred spirits scattered wide through the world and through the centuries. Only one who has devoted his life to similar ends can have a vivid realization of what has inspired these men and given them the strength to remain true to their purpose in spite of countless failures. It is cosmic religious feeling that gives a man such strength. A contemporary has said, not unjustly, that in this materialistic age of ours the serious scientific workers are the only profoundly religious people.

Science and Religion

This article appears in Einstein's Ideas and Opinions, pp.41 - 49. The first section is taken from an address at Princeton Theological Seminary, May 19, 1939. It was published in Out of My Later Years, New York: Philosophical Library, 1950. The second section is from Science, Philosophy and Religion, A Symposium, published by the Conference on Science, Philosophy and Religion in Their Relation to the Democratic Way of Life, Inc., New York, 1941.

Science and Religion I

Address: Princeton Theological Seminary, May 19, 1939

During the last century, and part of the one before, it was widely held that there was an unreconcilable conflict between knowledge and belief. The opinion prevailed among advanced minds that it was time that belief should be replaced increasingly by knowledge; belief that did not itself rest on knowledge was superstition, and as such had to be opposed. According to this conception, the sole function of education was to open the way to thinking and knowing, and the school, as the outstanding organ for the people's education, must serve that end exclusively.

One will probably find but rarely, if at all, the rationalistic standpoint expressed in such crass form; for any sensible man would see at once how one-sided is such a statement of the position. But it is just as well to state a thesis starkly and nakedly, if one wants to clear up one's mind as to its nature.

It is true that convictions can best be supported with experience and clear thinking. On this point one must agree unreservedly with the extreme rationalist. The weak point of his conception is, however, this, that those convictions which are necessary and determinant for our conduct and judgments cannot be found solely along this solid scientific way.

For the scientific method can teach us nothing else beyond how facts are related to, and conditioned by, each other. The aspiration toward such objective knowledge belongs to the highest of which man is capable, and you will certainly not suspect me of wishing to belittle the achievements and the heroic efforts of man in this sphere. Yet it is equally clear that knowledge of what is does not open the door directly to what should be. One can have the clearest and most complete knowledge of what is, and yet not be able to deduct from that what should be the goal of our human aspirations. Objective knowledge provides us with powerful instruments for the achievements of certain ends, but the ultimate goal itself and the longing to reach it must come from another source. And it is hardly necessary to argue for the view that our existence and our activity acquire meaning only by the setting up of such a goal and of corresponding values. The knowledge of truth as such is wonderful, but it is so little capable of acting as a guide that it cannot prove even the justification and the value of the aspiration toward that very knowledge of truth. Here we face, therefore, the limits of the purely rational conception of our existence.

But it must not be assumed that intelligent thinking can play no part in the formation of the goal and of ethical judgments. When someone realizes that for the achievement of an end certain means would be useful, the means itself becomes thereby an end. Intelligence makes clear to us the interrelation of means and ends.

But mere thinking cannot give us a sense of the ultimate and fundamental ends. To make clear these fundamental ends and valuations, and to set them fast in the emotional life of the individual, seems to me precisely the most important function which religion has to perform in the social life of man. And if one asks whence derives the authority of such fundamental ends, since they cannot be stated and justified merely by reason, one can only answer: they exist in a healthy society as powerful traditions, which act upon the conduct and aspirations and judgments of the individuals; they are there, that is, as something living, without its being necessary to find justification for their existence. They come into being not through demonstration but through revelation, through the medium of powerful personalities. One must not attempt to justify them, but rather to sense their nature simply and clearly.

There is no room in this for the divinization of a nation, of a class, let alone of an individual. Are we not all children of one father, as it is said in religious language? Indeed, even the divinization of humanity, as an abstract totality, would not be in the spirit of that ideal. It is only to the individual that a soul is given. And the high destiny of the individual is to serve rather than to rule, or to impose himself in any other way.

If one looks at the substance rather than at the form, then one can take these words as expressing also the fundamental democratic position. The true democrat can worship his nation as little as can the man who is religious, in our sense of the term.

What, then, in all this, is the function of education and of the school? They should help the young person to grow up in such a spirit that these fundamental principles should be to him as the air which he breathes. Teaching alone cannot do that.

If one holds these high principles clearly before one's eyes, and compares them with the life and spirit of our times, then it appears glaringly that civilized mankind finds itself at present in grave danger. In the totalitarian states it is the rulers themselves who strive actually to destroy that spirit of humanity. In less threatened parts it is nationalism and intolerance, as well as the oppression of the individuals by economic means, which threaten to choke these most precious traditions.

A realization of how great is the danger is spreading, however, among thinking people, and there is much search for means with which to meet the danger—means in the field of national and international politics, of legislation, or organization in general. Such efforts are, no doubt, greatly needed. Yet the ancients knew something—which we seem to have forgotten. All means prove but a blunt instrument, if they have not behind them a living spirit. But if the longing for the achievement of the goal is powerfully alive within us, then shall we not lack the strength to find the means for reaching the goal and for translating it into deeds.

Science and Religion, II

Science and Religion II, Science, Philosophy and Religion, A Symposium, 1941

It would not be difficult to come to an agreement as to what we understand by science. Science is the century-old endeavor to bring together by means of systematic thought the perceptible phenomena of this world into as thoroughgoing an association as possible. To put it boldly, it is the attempt at the posterior reconstruction of existence by the process of conceptualization. But when asking myself what religion is I cannot think of the answer so easily. And even after finding an answer which may satisfy me at this particular moment, I still remain convinced that I can never under any circumstances bring together, even to a slight extent, the thoughts of all those who have given this question serious consideration.

At first, then, instead of asking what religion is I should prefer to ask what characterizes the aspirations of a person who gives me the impression of being religious: a person who is religiously enlightened appears to me to be one who has, to the best of his ability, liberated himself from the fetters of his selfish desires and is preoccupied with thoughts, feelings, and aspirations to which he clings because of their superpersonal value. It seems to me that what is important is the force of this superpersonal content and the depth of the conviction concerning its overpowering meaningfulness, regardless of whether any attempt is made to unite this content with a divine Being, for otherwise it would not be possible to count Buddha and Spinoza as religious personalities. Accordingly, a religious person is devout in the sense that he has no doubt of the significance and loftiness of those superpersonal objects and goals which neither require nor are capable of rational foundation. They exist with the same necessity and matter-of-factness as he himself. In this sense religion is the age-old endeavor of mankind to become clearly and completely conscious of these values and goals and constantly to strengthen and extend their effect. If one conceives of religion and science according to these definitions then a conflict between them appears impossible. For science can only ascertain what is, but not what should be, and outside of its domain value judgments of all kinds remain necessary. Religion, on the other hand, deals only with evaluations of human thought and action: it cannot justifiably speak of facts and relationships between facts. According to this interpretation the well-known conflicts between religion and science in the past must all be ascribed to a misapprehension of the situation which has been described.

For example, a conflict arises when a religious community insists on the absolute truthfulness of all statements recorded in the Bible. This means an intervention on the part of religion into the sphere of science; this is where the struggle of the Church against the

doctrines of Galileo and Darwin belongs. On the other hand, representatives of science have often made an attempt to arrive at fundamental judgments with respect to values and ends on the basis of scientific method, and in this way have set themselves in opposition to religion. These conflicts have all sprung from fatal errors.

Now, even though the realms of religion and science in themselves are clearly marked off from each other, nevertheless there exist between the two strong reciprocal relationships and dependencies. Though religion may be that which determines the goal, it has, nevertheless, learned from science, in the broadest sense, what means will contribute to the attainment of the goals it has set up. But science can only be created by those who are thoroughly imbued with the aspiration toward truth and understanding. This source of feeling, however, springs from the sphere of religion. To this there also belongs the faith in the possibility that the regulations valid for the world of existence are rational, that is, comprehensible to reason. I cannot conceive of a genuine scientist without that profound faith. The situation may be expressed by an image: science without religion is lame, religion without science is blind.

Though I have asserted above that in truth a legitimate conflict between religion and science cannot exist, I must nevertheless qualify this assertion once again on an essential point, with reference to the actual content of historical religions. This qualification has to do with the concept of God. During the youthful period of mankind's spiritual evolution human fantasy created gods in man's own image, who, by the operations of their will were supposed to determine, or at any rate to influence, the phenomenal world. Man sought to alter the disposition of these gods in his own favor by means of magic and prayer. The idea of God in the religions taught at present is a sublimation of that old concept of the gods. Its anthropomorphic character is shown, for instance, by the fact that men appeal to the Divine Being in prayers and plead for the fulfillment of their wishes.

Nobody, certainly, will deny that the idea of the existence of an omnipotent, just, and omnibeneficent personal God is able to accord man solace, help, and guidance; also, by virtue of its simplicity it is accessible to the most undeveloped mind. But, on the other hand, there are decisive weaknesses attached to this idea in itself, which have been painfully felt since the beginning of history. That is, if this being is omnipotent, then every occurrence, including every human action, every human thought, and every human feeling and aspiration is also His work; how is it possible to think of holding men responsible for their deeds and thoughts before such an almighty Being? In giving out punishment and rewards He would to a certain extent be passing judgment on Himself. How can this be combined with the goodness and righteousness ascribed to

Him?

The main source of the present-day conflicts between the spheres of religion and of science lies in this concept of a personal God. It is the aim of science to establish general rules which determine the reciprocal connection of objects and events in time and space. For these rules, or laws of nature, absolutely general validity is required—not proven. It is mainly a program, and faith in the possibility of its accomplishment in principle is only founded on partial successes. But hardly anyone could be found who would deny these partial successes and ascribe them to human self-deception. The fact that on the basis of such laws we are able to predict the temporal behavior of phenomena in certain domains with great precision and certainty is deeply embedded in the consciousness of the modern man, even though he may have grasped very little of the contents of those laws. He need only consider that planetary courses within the solar system may be calculated in advance with great exactitude on the basis of a limited number of simple laws. In a similar way, though not with the same precision, it is possible to calculate in advance the mode of operation of an electric motor, a transmission system, or of a wireless apparatus, even when dealing with a novel development.

To be sure, when the number of factors coming into play in a phenomenological complex is too large, scientific method in most cases fails us. One need only think of the weather, in which case prediction even for a few days ahead is impossible. Nevertheless no one doubts that we are confronted with a causal connection whose causal components are in the main known to us. Occurrences in this domain are beyond the reach of exact prediction because of the variety of factors in operation, not because of any lack of order in nature.

We have penetrated far less deeply into the regularities obtaining within the realm of living things, but deeply enough nevertheless to sense at least the rule of fixed necessity. One need only think of the systematic order in heredity, and in the effect of poisons, as for instance alcohol, on the behavior of organic beings. What is still lacking here is a grasp of connections of profound generality, but not a knowledge of order in itself.

The more a man is imbued with the ordered regularity of all events the firmer becomes his conviction that there is no room left by the side of this ordered regularity for causes of a different nature. For him neither the rule of human nor the rule of divine will exists as an independent cause of natural events. To be sure, the doctrine of a personal God interfering with natural events could never be refuted, in the real sense, by science, for this doctrine can always take refuge in those domains in which scientific knowledge has not yet been able to set foot.

But I am persuaded that such behavior on the part of the representatives of religion would not only be un-

worthy but also fatal. For a doctrine which is able to maintain itself not in clear light but only in the dark, will of necessity lose its effect on mankind, with incalculable harm to human progress. In their struggle for the ethical good, teachers of religion must have the stature to give up the doctrine of a personal God, that is, give up that source of fear and hope which in the past placed such vast power in the hands of priests. In their labors they will have to avail themselves of those forces which are capable of cultivating the Good, the True, and the Beautiful in humanity itself. This is, to be sure, a more difficult but an incomparably more worthy task. (This thought is convincingly presented in Herbert Samuel's book, *Belief and Action*.) After religious teachers accomplish the refining process indicated they will surely recognize with joy that true religion has been ennobled and made more profound by scientific knowledge.

If it is one of the goals of religion to liberate mankind as far as possible from the bondage of egocentric cravings, desires, and fears, scientific reasoning can aid religion in yet another sense. Although it is true that it is the goal of science to discover rules which permit the association and foretelling of facts, this is not its only aim. It also seeks to reduce the connections discovered to the smallest possible number of mutually independent conceptual elements. It is in this striving after the rational unification of the manifold that it encounters its greatest successes, even though it is precisely this attempt which causes it to run the greatest risk of falling a prey to illusions. But whoever has undergone the intense experience of successful advances made in this domain is moved by profound reverence for the rationality made manifest in existence. By way of the understanding he achieves a far-reaching emancipation from the shackles of personal hopes and desires, and thereby attains that humble attitude of mind toward the grandeur of reason incarnate in existence, and which, in its profoundest depths, is inaccessible to man. This attitude, however, appears to me to be religious, in the highest sense of the word. And so it seems to me that science not only purifies the religious impulse of the dross of its anthropomorphism but also contributes to a religious spiritualization of our understanding of life.

The further the spiritual evolution of mankind advances, the more certain it seems to me that the path to genuine religiosity does not lie through the fear of life, and the fear of death, and blind faith, but through striving after rational knowledge. In this sense I believe that the priest must become a teacher if he wishes to do justice to his lofty educational mission.

Religion and Science: Irreconcilable?

A response to a greeting sent by the Liberal Ministers' Club of New York City. Published in The Christian Register, June, 1948. Published in Ideas and Opinions, Crown Publishers, Inc., New York, 1954.

Does there truly exist an insuperable contradiction between religion and science? Can religion be superseded by science? The answers to these questions have, for centuries, given rise to considerable dispute and, indeed, bitter fighting. Yet, in my own mind there can be no doubt that in both cases a dispassionate consideration can only lead to a negative answer. What complicates the solution, however, is the fact that while most people readily agree on what is meant by "science," they are likely to differ on the meaning of "religion."

As to science, we may well define it for our purpose as "methodical thinking directed toward finding regulative connections between our sensual experiences." Science, in the immediate, produces knowledge and, indirectly, means of action. It leads to methodical action if definite goals are set up in advance. For the function of setting up goals and passing statements of value transcends its domain. While it is true that science, to the extent of its grasp of causative connections, may reach important conclusions as to the compatibility and incompatibility of goals and evaluations, the independent and fundamental definitions regarding goals and values remain beyond science's reach.

As regards religion, on the other hand, one is generally agreed that it deals with goals and evaluations and, in general, with the emotional foundation of human thinking and acting, as far as these are not predetermined by the inalterable hereditary disposition of the human species. Religion is concerned with man's attitude toward nature at large, with the establishing of ideals for the individual and communal life, and with mutual human relationship. These ideals religion attempts to attain by exerting an educational influence on tradition and through the development and promulgation of certain easily accessible thoughts and narratives (epics and myths) which are apt to influence evaluation and action along the lines of the accepted ideals.

It is this mythical, or rather this symbolic, content of the religious traditions which is likely to come into conflict with science. This occurs whenever this religious stock of ideas contains dogmatically fixed statements on subjects which belong in the domain of science. Thus, it is of vital importance for the preservation of true religion that such conflicts be avoided when they arise from subjects which, in fact, are not really essential for the pursuance of the religious aims.

When we consider the various existing religions as to their essential substance, that is, divested of their myths, they do not seem to me to differ as basically

from each other as the proponents of the "relativistic" or conventional theory wish us to believe. And this is by no means surprising. For the moral attitudes of a people that is supported by religion need always aim at preserving and promoting the sanity and vitality of the community and its individuals, since otherwise this community is bound to perish. A people that were to honor falsehood, defamation, fraud, and murder would be unable, indeed, to subsist for very long.

When confronted with a specific case, however, it is no easy task to determine clearly what is desirable and what should be eschewed, just as we find it difficult to decide what exactly it is that makes good painting or good music. It is something that may be felt intuitively more easily than rationally comprehended. Likewise, the great moral teachers of humanity were, in a way, artistic geniuses in the art of living. In addition to the most elementary precepts directly motivated by the preservation of life and the sparing of unnecessary suffering, there are others to which, although they are apparently not quite commensurable to the basic precepts, we nevertheless attach considerable importance. Should truth, for instance, be sought unconditionally even where its attainment and its accessibility to all would entail heavy sacrifices in toil and happiness? There are many such questions which, from a rational vantage point, cannot easily be answered or cannot be answered at all. Yet, I do not think that the so-called "relativistic" viewpoint is correct, not even when dealing with the more subtle moral decisions.

When considering the actual living conditions of presentday civilized humanity from the standpoint of even the most elementary religious commands, one is bound to experience a feeling of deep and painful disappointment at what one sees. For while religion prescribes brotherly love in the relations among the individuals and groups, the actual spectacle more resembles a battlefield than an orchestra. Everywhere, in economic as well as in political life, the guiding principle is one of ruthless striving for success at the expense of one's fellow men. This competitive spirit prevails even in school and, destroying all feelings of human fraternity and cooperation, conceives of achievement not as derived from the love for productive and thoughtful work, but as springing from personal ambition and fear of rejection.

There are pessimists who hold that such a state of affairs is necessarily inherent in human nature; it is those who propound such views that are the enemies of true religion, for they imply thereby that religious teachings are utopian ideals and unsuited to afford guidance in human affairs. The study of the social patterns in certain so-called primitive cultures, however, seems to have made it sufficiently evident that such a defeatist view is wholly unwarranted. Whoever is concerned with this problem, a crucial one in the study of religion as such, is advised to read the description of

the Pueblo Indians in Ruth Benedict's book, *Patterns of Culture*. Under the hardest living conditions, this tribe has apparently accomplished the difficult task of delivering its people from the scourge of competitive spirit and of fostering in it a temperate, cooperative conduct of life, free of external pressure and without any curtailment of happiness.

The interpretation of religion, as here advanced, implies a dependence of science on the religious attitude, a relation which, in our predominantly materialistic age, is only too easily overlooked. While it is true that scientific results are entirely independent from religious or moral considerations, those individuals to whom we owe the great creative achievements of science were all of them imbued with the truly religious conviction that this universe of ours is something perfect and susceptible to the rational striving for knowledge. If this conviction had not been a strongly emotional one and if those searching for knowledge had not been inspired by Spinoza's *Amor Dei Intellectualis*, they would hardly have been capable of that untiring devotion which alone enables man to attain his greatest achievements.

Albert Einstein

- 1879 Albert was born in Ulm, Germany.
- 1902 Albert Einstein got a job in the patent office.
- 1905 Einstein submitted three papers.
- 1909 Einstein got a job teaching theoretical physics at the University of Zurich.
- 1913 Theory of gravity
- 1922 Einstein was awarded his first Nobel Prize. He was on his way to Japan when he got the news.
- 1933 He visited America for the first time because he feared the rising Nazi party in Germany.
- 1945 World War II ended.
- 1955 Albert Einstein died in April of heart failure.

References

- [1] Albert Einstein on: Religion and Science:
<http://www.sacred-texts.com/aor/einstein/einsci.htm>
 in Internet Sacred Text Archive:
<http://www.sacred-texts.com/aor/index.htm>
 Prayer; Purpose in Nature; Meaning of Life; the Soul; a Personal God
 Conversation on Religion and Antisemitism