

Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy

History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. Introduction: Vitalism and Its Legacies in Twentieth Century Life Sciences and Philosophy.

Vitalism has spent most of the twentieth century, and part of the twenty-first, being perhaps the most misunderstood and reviled philosophy of life, with organicism being a close second (on the latter see (Martindale 2013), although some theorists seek to drive a wedge between the two in favor of a 'reasonable', less 'metaphysical' position often associated with organicism (Gilbert and Sarkar 2000). As a number of the essays in this collection point out (see especially the contributions by Donohue and Moir) vitalism has been conjoined to fascism and the Nazi horrors, and has been reduced to a series of ahistorical propositions. As both Moir and Donohue emphasize, such associations require more study, but at the same time are fundamentally misleading. Nonetheless, the traditional association of vitalism and fascism as well as vitalism and pseudoscience (or anti-science, as Shmidt underscores) has been remarkably pervasive, and still operates.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. On the Heuristic Value of Hans Driesch's Vitalism.

In the first half of the twentieth century the harshest critics of Hans Driesch's vitalistic theory depicted it as an animistic view driven by metaphysical moods, while others merely saw it as a barren hypothesis. In the last decades the heuristic value of vitalistic principles was nevertheless suggested. In this chapter I examine the epistemic role of Driesch's critical vitalism in the progress of embryology. I first show that it did not contribute to falsify mechanical explanations of development such as Wilhelm Roux's mosaic theory and Driesch's own embryonic induction model. However, Driesch's argumentation for vitalism led to the final formulation of the most

challenging developmental explanandum of the twentieth century: the harmonious-equipotential system (HES). I point out how major explanans like Charles M. Child's metabolic gradients, Hans Spemann's induction fields and Lewis Wolpert's positional information were conceived as promising answers to Driesch's problem.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. Canguilhem and the Greeks: Vitalism Between History and Philosophy.

In this essay, I examine the role of ancient Greek medicine and philosophy in Georges Canguilhem's analysis of vitalism at the intersection of history and philosophy in his essay "Aspects of Vitalism" in light of larger questions about the historicity of "life" as a concept in the history and philosophy of science and contemporary biopolitical theory. Vitalism, for Canguilhem, is not a proper object of the history of science. But nor is it a philosophy that exists outside of historical time. I show how Canguilhem embeds vitalism both historically and trans-historically by threading each of its three "aspects" in the essay through ancient Greece. Canguilhem distinguishes his own understanding of both life and vitalism from that of the "classical" vitalists of the eighteenth century by refusing to read ancient Greece as romantically naïve or pre-technological and instead locating a dialectic between vitalism and mechanism already in antiquity. I argue for a critical re-reading of Canguilhem's own conjunction of vitalism and Hellenism that resists its figuration of ancient Greece as the place where the human qua species first comes to take itself as an object of knowledge. I instead propose reading ancient Greek medical and philosophical texts that are read and reread in debates about the nature of human life and the life of Nature over millennia as part of a milieu that shapes how contemporary thinkers theorize life in the interest of human flourishing.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. What Is Living and What Is Dead in Political Vitalism?.

Does vitalism inherently imply a specific politics, and if so, what is it? In this chapter, I aim to offer at least some possible answers to this question by examining historical and contemporary discussions around the politics of vitalism. In so doing, I offer an account of what vitalism is as a set of scientific and philosophical ideas about the nature of life and its status as an object of study. It is precisely because vitalism is

concerned with the question of life that it implies political considerations from the get-go. However, some of the more problematic political consequences of what has often been referred to (sometimes erroneously or confusedly) as vitalism stem, I argue, from the attribution of vital powers to the non-living. This infusion of vitality into everything may seem egalitarian in its apparent levelling out of differences between forests, objects, spirits, the dead, and whole societies. Yet if everything is living, then the specificity of the living, the living itself, disappears. Whatever equality may or may not be purchased from this perspective, then, I argue that it can no longer properly be called vitalist.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. A 'Fourth Wave' of Vitalism in the Mid-20th Century?.

In his 1966 John Danz lectures, Francis H. C. Crick decried vitalism in the life sciences. Why did he do this three decades after most historians and philosophers of science regarded vitalism as dead? This essay argues that, by advocating the reduction of biology to physics and chemistry Crick was: (a) attempting to imbue the life sciences with greater prestige, (b) paving the way for bioengineering and the reduction of consciousness to molecules, and (c) trying to root out religious sentiment in the life sciences. In service of these goals, Crick deployed vitalism as a straw man enemy. His wave of so-called vitalists in the middle of the twentieth century in fact raised legitimate questions regarding the relationship of organisms to their DNA molecules that Crick was ill-equipped to answer. Moreover, most were not vitalists at all but advocates for what I term bioexceptionalism—an argument for the methodological utility of keeping biological pursuits within their own domains, distinct from physics and chemistry, regardless of the ontological status of living things. Nevertheless, Crick's status as a "cross-worlds influencer" entrenched a philosophically-enervated reductionism in the life sciences for decades.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. A Historico-Logical Re-assessment of Hans Driesch's Vitalism.

Today vitalism is widely dismissed as a metaphysical heresy. For instance, Brigandt and Love (Reductionism in biology. In: Zalta EN (ed) The stanford encyclopedia of philosophy, 2017) claimed that "the denial of physicalism by vitalism, the doctrine

that biological systems are governed by forces that are not physico-chemical, is largely of historical interest” (p. 3). Perhaps the most “infamous” vitalist is the German biologist Hans Driesch. However, Driesch (In Rádł E (ed) Actes du Huitième Congrès International de Philosophie a Prague 2–7 septembre 1934. Comité d’Organisation du Congrès, Prague, pp 10–30, 1936) himself very explicitly stated that his vitalism is “neither ‘mysticism’[...]nor ‘metaphysics’” (p. 27). So, in order to address the mismatch between the present conception of vitalism and his own, I seek to offer a historico-logical re-assessment of Driesch’s vitalism. From the historical point of view, I show that Driesch had provided long ignored theoretical reflections on the nature of entelechy (the central concept in his vitalism), especially those in relation to evolution and physics. From the logical point of view, following logical empiricists (Phillipp Frank and Rudolf Carnap), I indicate that Driesch’s vitalism should be rejected due to its lack of vital laws, at least with respect to current biology; it is an unestablished theory rather than a metaphysical heresy. Ironically, some current theoretical biologists have proposed similar theories (or principles and laws) of life, even though they (incoherently) reject Driesch’s vitalism. In the end, I briefly conclude that the failure of vitalism actually alludes to the fact that even today we understand very little about the nature of life (I mean, the pure concept/phenomenon of life!) (While I cannot elaborate here, it is of extremely importance not to conflate knowledge about the pure concept/phenomenon of life and knowledge about objects predicatable of life (Ben-Naim, manuscript, p. 281). For instance, it is common among philosophers of biology today to cite elementary knowledge in a particular biological discipline as offering a better understanding of life. Yet their promise fails to be delivered. At best, they are merely relying on knowledge about objects predicatable of life (in most cases, merely knowledge about complex organizations of matter: about heredity, reproduction, development, metabolism, etc); but such knowledge has not been shown of any relevance to the pure concept/phenomenon of life).

. History, Philosophy and Theory of the Life Sciences. Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. The Critical Difference Between Holism and Vitalism in Cassirer’s Philosophy of Science.

This chapter surveys Ernst Cassirer's responses to the vitalist and holist/organistic movements in biology during the early decades of the twentieth century. I argue that examination of the combination of Cassirer's enthusiasm for holism, and rejection of vitalism, puts into relief many themes and preoccupations that are consistent across Cassirer's philosophical career, and aids the interpretation of his philosophy of symbolic forms. I propose that it is useful to read the third volume of the *Philosophy of Symbolic Forms* as a critical response to anti-rationalistic tendencies in the philosophy of Henri Bergson, and other proponents of *Lebensphilosophie*. Hence the availability of holism, as a purportedly less obscure alternative to vitalism, suits this broader agenda. At the same time, Cassirer's acceptance of holism depends on a commitment to the autonomy of biology which is at odds with the physicalism of the Vienna Circle, but consistent with Heidegger's favourable response to holism in comparison with vitalism. Yet, in the end we are left with an interpretative puzzle about how Cassirer proposes to avoid the encroachment of physicalism into theorising in the biological and human sciences while maintaining his view that progress in science is the result of increasing quantification.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. Is There Not a Truth of Vitalism? Vital Normativity in Canguilhem and Merleau-Ponty.

The paper investigates the phenomenon of vitalism through the lens of vital normativity as expounded by Maurice Merleau-Ponty and Georges Canguilhem. I argue that the two authors independently developed complementary critiques of the mechanical-behaviourist conception of life sciences, which culminated in a surprisingly similar notion of life construed as a normative (polarized) activity, i.e., an activity that is not indifferent to its own conditions of possibility. Such an alternative conception of life has far-reaching consequences for the epistemology of life sciences, for it requires it to reconsider not only its object of inquiry - the nature of (the relationship between) an organism and its environment -, but also, since scientists themselves are living beings, the nature of its epistemic practices. What I call the truth of (a specific variety of) vitalism is thus reflected not only in how life is cognized, but also in how life cognizes (itself). This last point is of particular philosophical importance, as it paves the way towards a more dynamic conception of reflection (tentatively called *ouroboric thought*), which takes seriously that we, as

cognizers of life, at the same time live the lives of cognizers.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. Vitalism and the Problem of Individuation: Another Look at Bergson's *Élan Vital*.

Mikhail Bakhtin's 1926 essay, "Contemporary Vitalism," includes Bergson alongside Driesch in a short list of "the most published representatives of vitalism in Western Europe," and, indeed, Bakhtin's critique of Driesch is intended to undermine what he calls the "conceptual framework" of "contemporary vitalism" as a whole (The crisis of modernism: Bergson and the vitalist controversy. Eds. Frederick Burwick and Paul Douglass. Cambridge University Press, New York, 1992, p 81). The conceptual framework that Driesch and Bergson are supposed to have shared in common consists at bottom, for Bakhtin, in the ontological commitment to the autonomy of life, "its independence, its disconnectedness from physical-chemical phenomena" (81). This has long been understood as the defining mark of vitalism, at least in the mind of its critics: the contention that matter and the mechanical models that track it are insufficient to the reality of biological forms, and that the explanation of life therefore requires the postulation of a non-mechanical, possibly immaterial, uniquely vital principle, force, substance, or property. Recent scholarship has made considerable headway in complicating these pictures by attending to earlier and subtler forms of materialism, and by distinguishing between different types of vitalism and drawing out the heuristic or scientific utility of some of them (Wolfe, *Eidos* 14: 212–235, 2011, *Antropol Exp* 17(13): 215–224, 2017; cf. Wolfe and Normandin, *Vitalism and the scientific image in post-enlightenment life science, 1800–2010*. Springer, Dordrecht, 2013). The focus of some of this work has been on the critical reevaluation of Driesch himself (Bognon et al., *Kairos J Philos Sci* 20(1): 113–140, 2018). Yet the status of Bergson's commitment to the existence of a vital principle remains underdeveloped. In the midst of what some are calling a "Bergson renaissance," I think that it calls for the same kind of critical reappraisal (Ansell-Pearson, *Bergson: thinking beyond the human condition*. Bloomsbury, New York, 2018: 1; cf. Lundy, *Deleuze's Bergsonism*. Edinburgh University Press, Edinburgh, p 5, 2018). The aim of this paper is to attempt the outline of an answer to that call. I begin with a brief summary of Driesch's vitalism, then I reconstruct Bergson's underappreciated critique of internal finality, or what Kant called inner purposiveness, and locate in it a subterranean

criticism of vital principles of the Drieschian variety as well. Two consequences follow: first, if Bergson is to be considered a vitalist, it cannot be in the Drieschian sense and we are therefore wrong to associate the two; and second, if Bergson is to be considered a vitalist, then his vitalism has to be understood—somewhat counterintuitively, and certainly contra Driesch—on the basis of a principle external to the ostensible individuality of biological forms.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. Canguilhem and the Logic of Life. We examine aspects of Canguilhem's philosophy of biology, concerning the knowledge of life and its consequences on science and vitalism. His concept of life stems from the idea of a living individual endowed with creative subjectivity and norms, a Kantian view which "disconcerts logic." In contrast, we examine two naturalistic perspectives in the 1970s exploring the logic of life (Jacob) and the logic of the living individual (Maturana and Varela). Canguilhem can be considered to be a precursor of the second view, but there are divergences; for example, unlike them, he does not dismiss vitalism, often referring to it in his work, and even at times describing himself as a vitalist. The reason may lie in their different views of science.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. "A Mountain of Nonsense"? Czech and Slovenian Receptions of Materialism and Vitalism from c. 1860s to the First World War.

In general, historians of science and historians of ideas do not focus on critical appraisals of scientific ideas such as vitalism and materialism from Catholic intellectuals in eastern and southeastern Europe, nor is there much comparative work available on how significant European ideas in the life sciences such as materialism and vitalism were understood and received outside of France, Germany, Italy and the UK. Insofar as such treatments are available, they focus on the contributions of nineteenth century vitalism and materialism to later twentieth ideologies, as well as trace the interactions of vitalism and various intersections with the development of genetics and evolutionary biology see Mosse (The culture of Western Europe: the nineteenth and twentieth centuries. Westview Press, Boulder, 1988, Toward the final solution: a history of European racism. Howard Fertig Publisher, New York, 1978; Turda et al., Crafting humans: from genesis to eugenics

and beyond. V&R Unipress, Goettingen, 2013). English and American eugenicists (such as William Caleb Saleeby), and scores of others underscored the importance of vitalism to the future science of “eugenics” (Saleeby, *The progress of eugenics*. Cassell, New York, 1914). Little has been written on materialism qua materialism or vitalism qua vitalism in eastern Europe.

The Czech and Slovene cases are interesting for comparison insofar as both had national awakenings in the middle of the nineteenth century which were linguistic and scientific, while also being religious in nature (on the Czech case see David, *Realism, tolerance, and liberalism in the Czech National awakening: legacies of the Bohemian reformation*. Johns Hopkins University Press, Baltimore, 2010; on the Slovene case see Kann and David, *Peoples of the Eastern Habsburg Lands, 1526-1918*. University of Washington Press, Washington, 2010). In the case of many Catholic writers writing in Moravia, there are not only slight noticeable differences in word-choice and construction but a greater influence of scholastic Latin, all the more so in the works of nineteenth century Czech priests and bishops.

In this case, German, Latin and literary Czech coexisted in the same texts. Thus, the presence of these three languages throws caution on the work on the work of Michael Gordin, who argues that scientific language went from Latin to German to vernacular. In Czech, Slovenian and Croatian cases, all three coexisted quite happily until the First World War, with the decades from the 1840s to the 1880s being particularly suited to linguistic flexibility, where oftentimes writers would put in parentheses a Latin or German word to make the meaning clear to the audience. Note however that these multiple paraphrases were often polemical in the case of discussions of materialism and vitalism.

In Slovenia (as *Time* or *The Times*) ran from 1907 to 1942, running under the muscular editorship of Fr. Aleš Ušeničnik (1868–1952) devoted hundreds of pages often penned by Ušeničnik himself or his close collaborators to wide-ranging discussions of vitalism, materialism and its implied social and societal consequences. Like their Czech counterparts Fr. Matěj Procházka (1811–1889) and Fr. Antonín Lenz (*Materialism, Mechanism, Dynamism* (1829–1901), materialism was often conjoined with "pantheism" and immorality. In both the Czech and the Slovene cases, materialism was viewed as a deep theological problem, as it made the

Catholic account of the transformation of the Eucharistic sacrifice into the real presence untenable. In the Czech case, materialism was often conjoined with “bestiality” (bestialnost) and radical politics, especially agrarianism, while in the case of Ušeničnik and Slovene writers, materialism was conjoined with “parliamentarianism” and “democracy.” There is too an unexamined dialogue on vitalism, materialism and pan-Slavism which needs to be explored.

Writing in 1914 in a review of *O bistvu življenja* (Concerning the essence of life) by the controversial Croatian biologist Boris Zarnik) Ušeničnik underscored that vitalism was an speculative outlook because it left the field of positive science and entered the speculative realm of philosophy. Ušeničnik writes that it was “Too bad” that Zarnik “tackles” the question of vitalism, as his zoological opinions are interesting but his philosophy was not “successful”. Ušeničnik concluded that vitalism was a rather old idea, which belonged more to the realm of philosophy and Thomistic theology than biology. It nonetheless seemed to provide a solution for the particular characteristics of life, especially its individuality. It was certainly preferable to all the dangers that materialism presented. Likewise in the Czech case, Emmanuel Radl (1873–1942) spent much of his life extolling the virtues of vitalism, up until his death in home confinement during the Nazi Protectorate. Vitalism too became bound up in the late nineteenth century rediscovery of early modern philosophy, which became an essential part of the development of new scientific consciousness and linguistic awareness right before the First World War in the Czech lands. Thus, by comparing the reception of these ideas together in two countries separated by ‘nationality’ but bounded by religion and active engagement with French and German ideas (especially Driesch), we can reconstruct not only receptions of vitalism and materialism, but articulate their political and theological valances.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. *Metabolism in Crisis? A New Interplay Between Physiology and Ecology.*

This chapter investigates the hybrid relationships between metabolism, broadly and a-historically understood as the set of processes through which alien matter is made homogeneous to that of the organism, and forms of vitalism from the eighteenth century on. While metabolic processes have long been modeled in a reductionist fashion as a straightforward function of repair and expansion of a given structure

(either chemically, or mechanistically), a challenging vitalist view has characterized metabolism as a creative, organizing, vital faculty. I suggest that this tension was overcome in Claude Bernard's works on "indirect nutrition", in which nutrition, rightly conceived as a general vital phenomenon common to plants and animals, was both characterized as an instance of the general physico-chemical determinism of all phenomena and as the sign and condition of the "freedom and independence" of the organism with respect to the environment. I propose that Bernard's theory of indirect nutrition was central in the elaboration of his general physiology and has, at the same time, underpinned a self-centered view of biological identity in which the organism creates itself continuously at the detriment of its external milieu. I further argue that this conception of biological individuality as metabolically constructed has since, and paradoxically, supported a view in which the organism appears as an autonomous and self-creating entity. I then contrast this classical view of the metabolic autonomy of the organism with the challenges raised by microbiome studies and suggest that these emerging fields contribute to sketch an ecological conception of the organism and its metabolism through the reconceptualization of its relationship with the environment. The recent focus on a "microbiota – host metabolism" axis contributes to shift the focus away from the classical concept of organism, somehow externalizing vitalism out of the autonomous individual in favor of an ecological, collaborative, and interactionist view of the living.

. History, Philosophy and Theory of the Life Sciences, Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy. Vitalist Arguments in the Struggle for Human (Im)Perfection: The Debate Between Biologists and Theologians in the 1960s–1980s.

In this chapter, I explore and offer critical reflections on the widespread practice of attributing negative value to "vital forces" in debates on health and disease, as the direct result of the extensive dissemination of genetics and its implications since the late 1960s. This historical reconstruction focuses on the most heated debates in popular science periodicals and editions, having the longest-lasting public "echo," which have shaped an intergenerational continuity in the reproduction of vitalist arguments in discursive practices regarding health, disease, and their genetic factors.

Mapping attacks on vital forces as various forms of negation addresses three different debates in the historically interrelated repertoire of potentially rival approaches to health, disease, and their genetic components: (1) the attribution of negative value to primal instinct as an obstacle to the progress of human civilization; (2) the normative vitalism mainly associated with French philosophers George Canguilhem, Michel Foucault, and Gilles Deleuze; and (3) the movement for the deinstitutionalization of health care within the negative theology presented by Ivan Illich.

The reproduction of vitalist arguments in the each of the three realms is seen as a historical continuity of the medical vitalism that appeared in the Enlightenment and that produced a less monolithic and more conceptually coherent continuum of the positions regarding health, diseases, and their causes. In line with the Lakatosian division into internalist and externalist histories of science, I focus on the multiple functions of vitalist arguments: as a main force in the contest among rival theories regarding health and disease (as a part of the internalist narrative); as a signifier of the boundary work delineating science and not-science, whether labeled as theology or as “bad” science aimed at legitimizing science (as a part of externalist history); and as an ideological platform for bridging science and its performance in policies concerning reproduction .

. HOPOS: The Journal of the International Society for the History of Philosophy of Science. HOPOS: The Journal of the International Society for the History of Philosophy of Science. : *Vitalism and Its Legacy in Twentieth Century Life Sciences and Philosophy*. History and Philosophy of the Life Sciences. HPLS. A non-metaphysical evaluation of vitalism in the early twentieth century. Life and Death in Early Modern Philosophy. the Discreet Charm of Eighteenth-Century Vitalism. Vitalism and the Metaphysics of Life.

I examine a series of definitions, defences and rejections of early modern vitalism. This yields a broad distinction between more or less metaphysically committed forms of vitalism. Given the plurivocity of the term, I suggest that we restrict the term ‘vitalist’ to thinkers who are actively concerned with the distinction between life and non-life (whether or not they substantialize this distinction), with special reference to the case of eighteenth-century Montpellier vitalism – where the term was first

explicitly used. Further, I discuss the association of vitalism with a (potentially problematic) metaphysics of life as partly a polemical construct – which is internal to the process of defining projects and programs in life science, where one vital(istical)ly oriented author will, almost desperately, seek to brand a predecessor or a rival as a vitalist in order to legitimize her own apparently more ‘experimental’ brand of organicism. But perhaps metaphysics is endemic to vitalism?

. Plato. Plato’s Legacy in Pre-Twentieth-Century Educational Philosophy. Philosophy of Mathematics in the Twentieth Century. 1 THE KANTIAN LEGACY IN TWENTIETH-CENTURY FOUNDATIONS OF MATHEMATICS. History, Philosophy and Theory of the Life Sciences, Vitalism and the Scientific Image in Post-Enlightenment Life Science, 1800-2010. Wilhelm Reich: Vitalism and Its Discontents

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DATSUN 240Z REPAIR MANUAL

Science and Transport Progress. STP. CONFORMANCE RATING FOR LOCOMOTIVE REPAIR PRODUCTIONS.

Purpose. Inspection and observation of the technical level of rail locomotive repair productions are conducted by the management team of the Department and the Locomotive division, audit sectors, expert groups within the production certification procedure. The faults revealed are fixed as linguistic expert reports which cannot assess their significance and identify priorities in terms of elimination. The paper aimed the development of methods for the conformance rating for locomotive repair production to legal requirements with conformance level determination. Methodology. Formalization of linguistic reports on the locomotive repair facility conformance takes into account the influence of a whole number of factors, their significance being determined by the expert assessment, formalized models of events when designing and analyzing the fault tree. In order to calculate the

conformance, index the triple additive convolution with the weight coefficient is proposed. Investigation into interrelation between the integral index and the locomotive maintenance costs was conducted by methods of the correlation and regression analysis. Findings. The analysis of results of inspection and observation of the technical level of locomotive repair productions demonstrated a similar structure of expert reports on faults, which made it possible to present them as a vector. While transforming a multi-criterion problem into a single-criterion one of the most objective method, the weighted sum method, was applied. The conformance indices were calculated according to the results of observations on several locomotive repair productions. The correlation and regression analysis proved the influence of the conformance index of locomotive repair productions on locomotive maintenance overconsumption. Originality. The conformance rating methods for a technical level of locomotive repair productions based on linguistic expert reports which consider type of the fault detected, type of the technological process, type of the locomotive unit and type of the technical level of production have been designed. Practical value. Implementation of the methods designed will help undertake assessment of the faults detected, eliminate them according to the priority and invest more effectively in locomotive repair productions. The regressive equations obtained allow standardizing the conformance index and forecasting possible locomotive maintenance overconsumption by the results of inspection at repair productions.

. International Journal of Engineering & Technology. IJET. Design of Algorithm for Identification of Locomotive Electrical Machine Unit During Repair.

The purpose of this article is the design of an algorithm for identification of locomotive electrical machine unit by robotic cleaning facility during repair. The recognition and identification of objects is affected by several random factors and is the probabilistic process. the Johnson criterion was used as the criterion that allows making decision on fulfilment of the identification task with the specified degree of reliability. The diameter of locomotive fuel and oil pump motor fittings was adopted as the critical minimal dimension of the object to be identified. It was calculated that for identification of locomotive electrical machine unit the digital image should have dimensions of 80?80 pixels. The identification of 80?80 two-dimensional vector requires larger memory space and longer system learning time. The decrease of input data amount is possible by image additional processing. In order to decrease

the unit identification system input data amount the algorithm foreseeing input vector of values generation using summarization of pixel binary codes over lines was developed. The unit identification system was built on the basis of the multilayer perceptron and was modeled in Neural Network Toolbox MATLAB package. The best learning error magnitude result was shown by the network with 40 hidden layers.

. A Simple book repair manual. Collected scientific works of Ukrainian State University of Railway Transport. ??????????????????. THE USE OF MODERN STRATEGIES FOR IMPROVEMENT OF SYSTEM OF TECHNICAL SERVICE AND REPAIR OF LOCOMOTIVES. Examination of Datsun disc brake caliper assemblies. Disc brake caliper assemblies from Datsun 240Z automobiles were examined in an effort to determine what was responsible for the jamming of the brake pad backing plates in the caliper castings. On the basis of metallographic examinations, electron probe microanalysis and X-ray diffraction analysis, it is apparent that a combination of corrosion products and road grime are accumulating in this area and causing the units to seize.

. Collection of scientific works of the Ukrainian State University of Railway Transport. DETERMINATION OF THE RATIONAL STRUCTURE OF PRODUCTION FOR THE REPAIR OF LOCOMOTIVES ACCORDING TO ECONOMIC CRITERIA. Pressure Vessel and Stacks Field Repair Manual. L52047 PRCI Pipeline Repair Manual 6th Edition.

Note the PRCI Pipeline Repair Manual 2021 Edition is now available and supersedes this edition. The 2021 Edition is available [here](#). Technology advancements in materials, techniques, new products, procedures, etc. offer pipeline companies the opportunity to extend the safe life of assets in place. A comprehensive Pipeline Repair Manual is needed to address these new advances, provide engineering guidance to choose appropriate repair techniques for specific defects in pipelines. This new updated Pipeline Repair Manual provides guidance to pipeline operators as they: (1) choose appropriate repair techniques for specific defects in in-service pipelines; (2) develop or enhance their own procedures and/or manuals for pipeline repairs; (3) or train or qualify maintenance personnel. The manual presents a catalog of known pipeline repair techniques, and discusses the various types of pipeline defects that lend themselves to being repaired while in-

service. A matrix is provided to match defects in need of repair with appropriate repair methods. In addition defect assessment methods are presented as are safety considerations related to making in-service repairs. The manual is divided into the following major sections: (1) Response to the discovery of an anomaly or defect - this section presents safety issues and defines critical information that is required to make an appropriate repair response. (2) Pipeline repair methods - this section describes the known methods of repairing in-service pipelines. (3) Appropriate repairs for various types of defects - this section matches the types of defects that are likely to be encountered in in-service pipelines with appropriate repair methods. (4) Repair methods in Europe - this section was added after a review of the draft by a committee of pipeline repair specialists from several European pipeline operators who are members of the Group Europeene de Recherches Gazieres (GERG). It contains suggestions made by the committee to enhance the substance of this manual and to inform readers concerning European practices. (5) Guidelines for repair procedures - this section presents a model procedure, which a pipeline operator may use to create, enhance, or evaluate repair procedures. This document was formerly known as 'Updated Pipeline Repair Manual Revision 6'

. L51679 Diver Assisted Pipeline Repair Manual.

Much of the industries offshore pipeline system, especially in water depths of 100 ft. or less, is approaching its design life. As this pipeline system ages, the likelihood of a failure due to erosion and/or corrosion in any part of the system is expected to increase. Other factors such as operational errors, vessel related impacts, and environmental phenomenon all contribute to offshore pipeline failures. The basic technology for repairing damaged or failed pipelines offshore has been known for several years. This technology continues to be refined and developed to meet more hostile environments and to improve reliability. At the same time, attempts are being made to minimize the time taken to affect a repair, thereby reducing the downtime of the line and the total cost of the repair. Three volumes intended to provide the field engineer a guide for the identification and selection of an appropriate diver-assisted repair method for the determination of the required service support, the location of the appropriate repair hardware, and an estimation of the time and cost associated with the repair.

. The SAGES Manual of Hernia Repair. Repair of Paraesophageal Hernia. IOP

Conference Series: Materials Science and Engineering. IOP Conf. Ser.: Mater. Sci. Eng.. Development of a repair technology for locomotive units on the basis of the theory of decision.

The operative condition of locomotives is maintained by the existing repair system; it consists of the following elements: strategy, organization and technology. This repair technology for units and aggregates is based on disassembling and elimination of defects, and it can be inappropriate. The actual technical condition of the nodes requires an individual approach in determining the volume and content of technological impact during the repair process. Therefore, the purpose of this work is to research the task of developing a repair technology for locomotive units, depending on their actual technical condition. As far as probability distribution functions of the operating condition of units are known, a repair technology is chosen under risky conditions. Therefore, the decision-finding problem is framed in the theory of decision terms. The analysis of the decision tree of the choice of repair technology for fuel injectors of a diesel locomotive demonstrated that at least four variants of technologies (strategies) were possible. Operational costs were taken as the evaluation criterion for the technological process. The pay-off matrix obtained does not have a saddle point; therefore, the problem of choice of the technology cannot be solved only strategically. It substantiates a need to use flexible, adaptive repair technologies which consider the actual technical state of each unit. For a known distribution of states for fuel injectors, the greatest gain with minimum risks is the repair technology of dismantling and reseating the worn-out parts. Application of the described approach at locomotive repair enterprises will allow for improvement of the quality of repair and reduction of costs.

. The SAGES Manual of Hernia Repair. Technique: Laparoscopic Ventral/Incisional Hernia Repair. Pressure Vessel and Stacks Field Repair Manual. Dedication. The SAGES Manual of Hernia Repair. Results of Laparoscopic Repair of Inguinal Hernia. Multimedia Manual of Cardio-Thoracic Surgery. Multimedia Manual of Cardio-Thoracic Surgery. Ventricular reconstruction or aneurysm repair using a modified linear repair technique with septal patch when indicated. Pressure Vessel and Stacks Field Repair Manual. Copyright. Auto Tech Review. Auto Tech Rev. Federal Mogul, Datsun. Sel'skohozejstvennaja tehnika: obsluzhivanie i remont (Agricultural Machinery: Service and Repair). Agricultural Machinery: Service and Repair. Repair

and adjustment manual for mowers.

The manual for repair and adjustment of mowers is intended for farmers, machine operators and specialists involved in technical service and operation of agricultural machinery on farms and at repair and maintenance enterprises. When developing the manual, documentation from manufacturers, materials from research centers, and best practices in mower repair were used. The manual contains the main malfunctions of mower components and assemblies, provides instructions for eliminating them, and provides recommendations for cleaning, adjustment, running-in, storage and technological adjustment of the main working parts.

. The SAGES Manual of Hernia Repair. Urinary Retention After Laparoscopic Inguinal Hernia Repair. The SAGES Manual of Hernia Repair. Intraoperative Complications During Laparoscopic Hernia Repair

TWO WARS WE MUST NOT LOSE WHAT CHRISTIANS NEED TO KNOW ABOUT RADICAL ISLAMISTS RADICAL SECULARISTS AND WHY WE CANT LEAVE THE BATTLE UP TO OUR DIVIDED GOVERNMENT

Uninformed Why People Seem to Know So Little about Politics and What We Can Do about It. What We Know. What We Know.

To offer prospective learners information that yields high net benefits, it is important to understand what they already know. How do educators learn about others' knowledge? Surveys are a common source of information. In part II of this book, I focus on these surveys and how many different kinds of educators use them. My goal throughout part II is to improve educators' measures and understanding of what people do and do not know about politics. Better measurement and more accurate inferences from data can help educators more effectively diagnose whether individuals have the knowledge they need to achieve desired competences. Where faulty diagnoses can lead educators to offer information that prospective learners neither want nor need, improved diagnoses can help educators identify information that can help others make more competent decisions. The way that we will achieve

the improvements just described is by examining survey-based research and political commentary on a concept that many people call “political knowledge.” The best-known academic book on political knowledge defines it as “the range of factual information about politics that is stored in long-term memory.” The survey questions that are most relevant for this purpose are recall questions. Recall questions are designed to measure whether or not a person has selected declarative memories. “Who is the Vice President of the United States?” is an example of a commonly asked recall question. Interpretations of responses to recall questions are the evidentiary basis for thousands of books and articles on political knowledge and ignorance. If these data accurately measure what people know, and if analysts accurately interpret the data, then educators can use the interpretations to compare what an audience knows to necessary and sufficient conditions for competence at a given task. Part II’s main tension is that not all data and interpretations are accurate. Some survey data are inaccurate, as happens when a survey organization records a survey participant’s response incorrectly. Similarly, some interpretations of survey data are inaccurate, as happens when an analyst uses a survey to make a claim about ignorance that is inconsistent with the survey’s actual content.

. Rhetoric versus Reality: What We Know and What We Need To Know About Vouchers and Charter Schools. *Translational Andrology and Urology*. *Transl Androl Urol*. Abdominal distension following radical cystectomy: what we know and what we need to know. *Exposed*. 6. What We Must Do. *Journal of Pediatrics & Neonatal Biology*. JPNB. Monkeypox Infection, what we need to Know About. *Monkeypox Infection*, what we need to Know About.

Monkeypox virus is an orthopoxvirus which was isolated for the first time in the 1950s from a group of unwell monkeys. It is in the same genus as variola that causes smallpox and vaccinia viruses. Although they are famously suspicious, there’s no clear evidence that monkeys are the primary natural reservoir of the Monkeypox virus. However, humans and monkeys are considered to be incidental hosts. Monkeypox is usually acquired by humans through contact with animal fluid or bites, nevertheless, the human-to-human infection may occur through contact with infectious skin, exposure to large respiratory droplets and/or prolonged face-to-face contact within 6 feet for more than 3 hours without appropriate protections. Interestingly, the most recent outbreak that took place in May 2022 in non-endemic

places has been linked to some sexual activities through an unknown mechanism. After the discontinuation of smallpox vaccination in 1979, monkeypox was endemic in Central and West Africa with sporadic cases reported in other non-endemic countries, mostly in returning travellers from endemic areas. In 2003, the United States of America reported an outbreak of monkeypox virus from infected prairie dogs who were in contact with imported animals from Africa. The incubation period of the monkeypox virus is 6 to 13 days with a range of 5 to 21 days. The most common presenting features of monkeypox are rash, fever, lymphadenopathy, chills, and myalgias. It is usually a mild disease that might be associated with nausea and vomiting, and Most of the infected persons recover without intervention. However, more serious cases might require hospitalization and supportive care. Laboratory confirmatory tests are essential to differentiate monkeypox from fever and rash diseases. These include (i) virus isolation in mammalian cell cultures, (ii) direct electron microscopy, (iii) real-time polymerase chain reaction (PCR), and (iv) enzyme-linked immunosorbent assay (ELISA), and (v) immunofluorescent antibody assay. The public health authorities should be notified according to most states' health regulations. Varicella, smallpox, herpes simplex infection, and other orthopoxvirus infections are the differential diagnosis for Monkeypox. Tecovirimat and brincidofovir are the approved antiviral treatment for smallpox in the United States as their activity against monkeypox are approved in animals and are expected to be effective in human infection. Cidofovir has in vitro effect against monkeypox with a particular effect against lethal monkeypox in animal models. Contact, droplet, and airborne standard precaution measures are essential for any hospitalized patient with a generalized unknown vesicular rash as monkeypox and smallpox are part of the differential diagnosis. Pre- and post-exposure smallpox vaccination prophylaxis are reasonable options for select circumstances with appropriate notifications of public health authorities. In this review, we will discuss briefly the virology, geographic distribution, diagnosis and management of monkeypox infection.

. Introduction to Information Behaviour. What is information behaviour and why do we need to know about it?. What the Metaverse is (really) and why we need to know about it.

The major technology companies are investing significant sums of money in the creation of the metaverse whose main feature will be the fusion between the virtual

world and the physical one. To allow this possibility is one of the less obvious features of the metaverse: the metaverse works like our minds. This ability makes the metaverse a significantly different technology from its predecessors. If television and social media are persuasive technologies, because of their ability to influence people's attitudes and behaviors, the metaverse is instead a transformative technology, capable of modifying what people think reality is. To achieve this goal the technologies of the metaverse hacks different key cognitive mechanisms: the experience of being in a place and in a body, the processes of brain-to-brain attunement and synchrony, and the ability of experiencing and inducing emotions. Clearly, these possibilities define totally new scenarios with positive and negative outcomes. Educating ourselves as to its promise, and the challenges it may present, is a necessity. This requires a “humane”, integrated and multidisciplinary approach, with stakeholders at the supranational level joining in the conversation.

. Making Peace Work. Economic Agendas in Civil Wars: What We Know, What We Need to Know. Uninformed Why People Seem to Know So Little about Politics and What We Can Do about It. Political Knowledge Scales: Something Doesn't Add Up. Political Knowledge Scales: Something Doesn't Add Up.

In 2012, a Fairleigh Dickinson University (FDU) survey made headlines. The headlines questioned Fox News viewers' intelligence. The Nation's headline read: “It's Official: Watching Fox Makes You Stupid.” It claimed that “[a] ccording to a new study by Farleigh Dickinson University, Fox viewers are the least knowledgeable audience of any outlet, and they know even less about politics and current events than people who watch no news at all.” It concluded that Fox News “fails the fundamental test of journalism: Are you informing your audience?” The Huffington Post (2012) claimed that “people who only watch Fox News are less informed than all other news consumers.” The New York Times' Timothy Egan (2014) repeated the assertion. Conservative-leaning publications interpreted FDU's findings differently. The Examiner's headline read “Democrats Use Biased ‘Study’ to Smear Fox News.” It claimed that the pollsters “abandoned all integrity to vindictively trash Fox News and peddle the partisan smear that anyone who watches ‘right-wing propaganda’ (anything that includes multiple sides of the story) is stupid.” FDU's report on its Public Mind Poll (2012) focused not on how respondents answered individual recall questions, but on an aggregate PK scale that FDU manufactured.

Like nearly all published PK scales, FDU's scale was formed by adding the number of correct answers respondents gave to a small set of recall questions. Such scales typically range in value from zero-to-five or zero-to-seven, with the high number representing the total number of recall questions included in the scale. If a respondent answers no questions correctly, they get a score of zero. If they answer all questions correctly, they get the highest possible score. PK scales are regularly used to represent "the range of factual information about politics that is stored in long-term memory." FDU's report and the subsequent media reports are based on the finding that Fox News viewers scored lower on FDU's PK scale than did viewers of other networks. In this chapter, I examine this case and other claims that are based on PK scales.

. Proceedings of the 2019 AERA Annual Meeting. What We Know and What We Need to Know About Undergraduate Research. What Can We Know about Jesus?. What Can We Learn from Our Oldest Gospel?. Innovation in Canada. Front Matter. KWL and KWL+: What We Know, What We Want to Know, What We Learn/Still Need to Learn. KWL and KWL+: What We Know, What We Want to Know, What We Learn/Still Need to Learn. Welfare Reform and its Long-Term Consequences for America's Poor. What We Know, What We Don't Know, and What We Need to Know about Welfare Reform. Decision letter for "What we know about the possible link between delirium and dementia with Lewy bodies, and why we need to learn more". Decision letter for "What we know about the possible link between delirium and dementia with Lewy bodies, and why we need to learn more". Handbook of Research On Entrepreneurship. Family entrepreneurship: what we know, what we need to know. What We Know About CSCL. ... and What We Do Not (But Need To) Know About CSCL. What We Know About CSCL. Innovation in Canada. WHAT CORPORATE DATA SHOW. What We Know About Climate Change. Our options

ELEMENTARY LINEAR ALGEBRA BY HOWARD ANTON NINTH EDITION

What is the content of elementary linear algebra? Topics include systems of linear equations, matrices and determinants; the geometry of vectors in Euclidean space; general properties of vector spaces, bases and dimension; linear transformations in two and three dimensions, eigenvalues and eigenvectors.

What grade is linear algebra? Linear algebra is usually taken by sophomore math majors after they finish their calculus classes, but you don't need a lot of calculus in order to do it.

Who is the father of linear algebra? Systems of linear equations arose in Europe with the introduction in 1637 by René Descartes of coordinates in geometry.

What is the introduction of linear algebra? Linear algebra is the study of linear combinations. It is the study of vector spaces, lines and planes, and some mappings that are required to perform the linear transformations. It includes vectors, matrices and linear functions. It is the study of linear sets of equations and its transformation properties.

Is elementary linear algebra harder than calculus? Linear algebra is easier than elementary calculus. Once the theorems in linear algebra are well understood most difficult questions can be answered. This doesn't apply to calculus and computational questions in calculus could be very embarrassing even with a deep rigorous understanding of the materials.

What the heck is linear algebra? Linear Algebra is a systematic theory regarding the solutions of systems of linear equations.

Is linear algebra the hardest math class? When it comes to the different levels of mathematics, linear algebra ranks at the “intermediate level,” but is quite tough, similar to calculus II. That said, there are many other advanced courses like topology and abstract algebra.

Is linear algebra upper level math? None of those courses are normally considered “upper-level”, although some colleges may consider linear algebra or differential equations as such. Typically, “upper-level” math courses include such things as abstract algebra, real analysis, differential geometry, topology, numerical analysis, complex analysis.

What is the point of linear algebra? Combined with calculus, linear algebra facilitates the solution of linear systems of differential equations. Techniques from linear algebra are also used in analytic geometry, engineering, physics, natural sciences, computer science, computer animation, and the social sciences

(particularly in economics).

Did Einstein use linear algebra? Additionally, much of his work required the use of differential equations, linear algebra, in addition to discrete math / propositional logic and matrices.

What is linear algebra used for in real life? Linear algebra plays an important role to determine unknown quantities. The real-life applications of linear algebra are: For calculation of speed, distance, or time. Used for projecting a three-dimensional view into a two-dimensional plane, handled by linear maps.

Is linear algebra similar to Calc 3? This course builds on the concepts learned in Calculus 1 and 2, and is more computational compared to the abstract nature of Linear Algebra. Calculus 3 is also applicable to various fields such as physics, engineering, and economics.

What is linear algebra for kids? Linear algebra is a branch of mathematics that deals with linear equations and their representations in the vector space using matrices. In other words, linear algebra is the study of linear functions and vectors. It is one of the most central topics of mathematics.

What is the hardest math?

How is linear algebra different from algebra? Linear algebra is a branch of algebra that applies to both applied as well as pure mathematics. It deals with the linear mappings between the vector spaces. It also deals with the study of planes and lines. It is the study of linear sets of equations with transformation properties.

What topics are taught in linear algebra?

What are the elementary operations in linear algebra? There are three elementary operations: multiplying an equation by a non-zero constant; adding a multiple of an equation to another equation; interchanging two equations.

What does elementary algebra consist of? It involves solving equations using numbers and letters, which can be difficult for students who feel like math is a hard class both in school and in college. The course covers simplifying expressions, solving equations, graphing lines, and working with exponents.

What does linear algebra contain? linear algebra, mathematical discipline that deals with vectors and matrices and, more generally, with vector spaces and linear transformations. Unlike other parts of mathematics that are frequently invigorated by new ideas and unsolved problems, linear algebra is very well understood.

CAMINOS STAGE 1

What is Stage 1 of Camino Portuguese? The first stage starts in the vibrant UNESCO heritage city of Porto, heads straight to the coast and goes through seaside towns and fishing villages, past river estuaries and sandy beaches.

What is the first stage of the Camino? Camino Frances Stage 1 - St Jean Pied de Port to Logroño The first day from St Jean Pied de Port is arguably the most physically demanding day on the whole month-long trek to Santiago, but it is very worthwhile.

What is Stage 1 of the French Camino? Walk the first stage of the Camino de Santiago, from St Jean which straddles the French and Spanish border, to Logrono in the famous wine-growing region of Rioja. Undoubtedly the toughest stage of the whole Camino de Santiago, but one filled with rewards.

Which Camino to do first? I'd say one of the most popular Camino routes e.g. Camino Frances or Camino Portuguese from Porto is the best route for beginners. Why? Simply because these routes have a very good infrastructure which means it's easy to find accommodation, support, and help.

Which Camino is the most difficult? Camino Primitivo – Most Challenging! The Camino Primitivo is 315 km and almost 200 miles long but can be broken into stages. The walk is one of the most beautiful but also challenging as you pass through a mountain range 1100m above sea level to descend to the hilly countryside of Galicia.

Which Camino is the easiest? The Camino Ingles: The Camino Ingles is a shorter route, starting in either Ferrol or A Coruna and stretching over 100 kilometers to Santiago de Compostela. The route is well-marked and offers a variety of accommodations and services, making it an easy option for walkers who are short

on time.

How hard is the first day of the Camino? The difficulty of your first day will largely depend on where you start. For example, the French Way (Camino Francés) begins in the Pyrenees at St. Jean Pied de Port, presenting a challenging uphill climb on the first day. On the other hand, the Portuguese Way (Camino Portugués) starts with a gentler, flatter terrain.

Can you walk the Camino in stages? Many people walk the Camino in "sections". Some collect a whole Camino's worth which they can present later for a Compostella. Just make sure that you have a credential as many albergues admit only pilgrims with a credential. The one from Galicia (the round) and the one from Castilla & Leon.

What age people walk the Camino?

How difficult is the El Camino Portuguese? You can tailor the route to suit your own fitness levels. But, a basic level is required to be able to walk each day for a long period. Of all the Camino routes, we think the Camino Portuguese is the least challenging. Although there is some elevation it is very limited compared to the Camino del Norte, for example.

How hard is day 1 of Camino Francés? The first day or two of the full Camino de Santiago involves getting over the Pyrenees. It presents perhaps the biggest challenge – Spain is Europe's most mountainous country, after Switzerland.

Which Portuguese Camino route is best? The Litoral Way goes along the coast, it's the best and the most popular option to walk out of the city. The Central Route is a 260 km/161 mi inland route from Porto to Santiago de Compostela. There are several historical towns along the way.

What is the Portuguese part of the Camino? The Camino Portugues The Portuguese Way (Camino Portugues) is a 620km long-distance route from Portugal's capital Lisbon to Santiago de Compostela in Spain. This guide splits the route into 25 stages, with two coastal options, and takes in historic and religious sites and stunning scenery.

PROGRAM TOEFL IBT AND ACADEMIC ENGLISH

What is iBT TOEFL? 1. TOEFL® Internet-based Test (iBT) The Internet-based Test of English as a Foreign Language (TOEFL® iBT) measures your ability to use and understand English as read, written, heard, and spoken in universities.

What is the difference between TOEFL iBT and paper edition? TOEFL iBT and PBT Content and Structure The iBT evaluates spoken English with a dedicated section, while the PBT does not assess speaking skills at all. The PBT's Structure and Written Expression section, in which test-takers must complete or correct sentences, has no counterpart on the iBT.

What is the TOEFL program? The TOEFL iBT test measures a test taker's ability to combine listening, reading, speaking and writing skills where it matters most — in the classroom. It gives your institution access to millions of students who have proven they have what it takes to succeed in an English-speaking academic environment.

What is the difference between TOEFL and TOEFL iBT? The TOEFL iBT test measures communication language ability in an academic context. The TOEFL Essentials Test measures the foundational elements of English proficiency in both academic and non-academic contexts. The TOEFL iBT test evaluates 100% academic English.

Is the TOEFL iBT test hard? The TOEFL Test is generally considered a difficult exam, even for near-native speakers. However, understanding the test format and question types has a real impact on getting a good score. The average test score is 81 in the TOEFL exam. It varies between 85 and 95.

How much does the TOEFL exam cost?

How long is the TOEFL iBT exam? Test time. The total test takes just under 2 hours to complete, but you should plan for 2.5 hours, allowing 30 minutes for check in.

What is the hardest section of the TOEFL? The hardest part of the TOEFL for many test takers is typically the Speaking section.

How many questions are on the TOEFL iBT test?

Can I take TOEFL for free? No, taking the TOEFL exam requires a fee, and it cannot be taken for free.

Who qualifies for TOEFL? If candidate has completed 10+2 or equivalent education from any recognized institution, then they are eligible to take the TOEFL exam. Generally, TOEFL language test is taken by the students who want to study abroad and helps the institutions assess their speaking, writing, listening, and reading abilities.

What is the minimum TOEFL score for USA? What is the minimum TOEFL score for USA student visa? Before applying for the US Student Visa, you must be accepted to a study program at accredited US institutions, which will require you to prove your English proficiency in IELTS or TOEFL. The minimum TOEFL score for USA Student Visa is 90 and for IELTS is 6.5.

Can I take TOEFL iBT at home? Test at home The TOEFL iBT Home Edition is the same TOEFL iBT test you would take at a test center, just taken from the privacy of your own home and monitored online by a human proctor. Availability: Available worldwide.

Are there 2 types of TOEFL? TOEFL test was introduced in 1964, since then it'd passed more than 20 million people. There are three types of the test: paper version (PBT - Paper-based Test), computer-based (CBT - Computer-based Test) and online version (iBT - Internet-based Test).

Which TOEFL is best? TOEFL iBT is the best test to take if you apply for universities abroad. TOEFL Essentials is the test you can take to visit the country for work or immigration purposes.

What is the minimum score to pass the TOEFL iBT exam? The minimum result for TOEFL iBT normally varies from 61 points (for example, Bowling Green State University) to 109 (Harvard). Analysis of TOEFL passing scores for the different universities has showed that the average score for the TOEFL iBT is about 74.2 for students and 82.6 for graduate students.

How long is the TOEFL iBT score valid? Your scores are valid for 2 years, so you may want to download and print a PDF copy of your score report. PDF score reports are ready for download 2 days after you receive your scores electronically through your ETS account.

How can I pass TOEFL easily?

Is it free to do TOEFL Online? The TOEFL simulation is free. You only need to register by entering the required personal information in the form and complete the test.

What happens if I fail the TOEFL test? You cannot pass or fail your TOEFL test but you can get an idea on whether your score is good enough or not. The good news is that universities accepting TOEFL scores as proof of your readiness to join them have minimum score requirements. Therefore, if you do not meet the requirements, you cannot enroll.

What is a good score on the TOEFL? An average TOEFL score is around 90. It may vary from 85 to 95. Anything above 100 is considered a good TOEFL score.

What is the difference between TOEFL iBT and iBT? TOEFL iBT, administered online, assesses all four language skills and is widely accepted by universities worldwide. In contrast, TOEFL ITP is paper-based and often used for internal assessment within institutions.

What does TOEFL iBT test include?

What is a good TOEFL iBT score? What is a good score for TOEFL? An average TOEFL score is around 90. It may vary from 85 to 95. Anything above 100 is considered a good TOEFL score.

What does the iBT means? The full form of an IBT is an Internet-Based Test. This is a type of standardized test conducted online in various academic institutions or government organizations.